WORLD'S KEY

COMMON CORE State Standards

Mathematics

LEVEL 4



WORLD'S KEY

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MATHEMATICS

LEVEL 4

2024

MATHEMATICS

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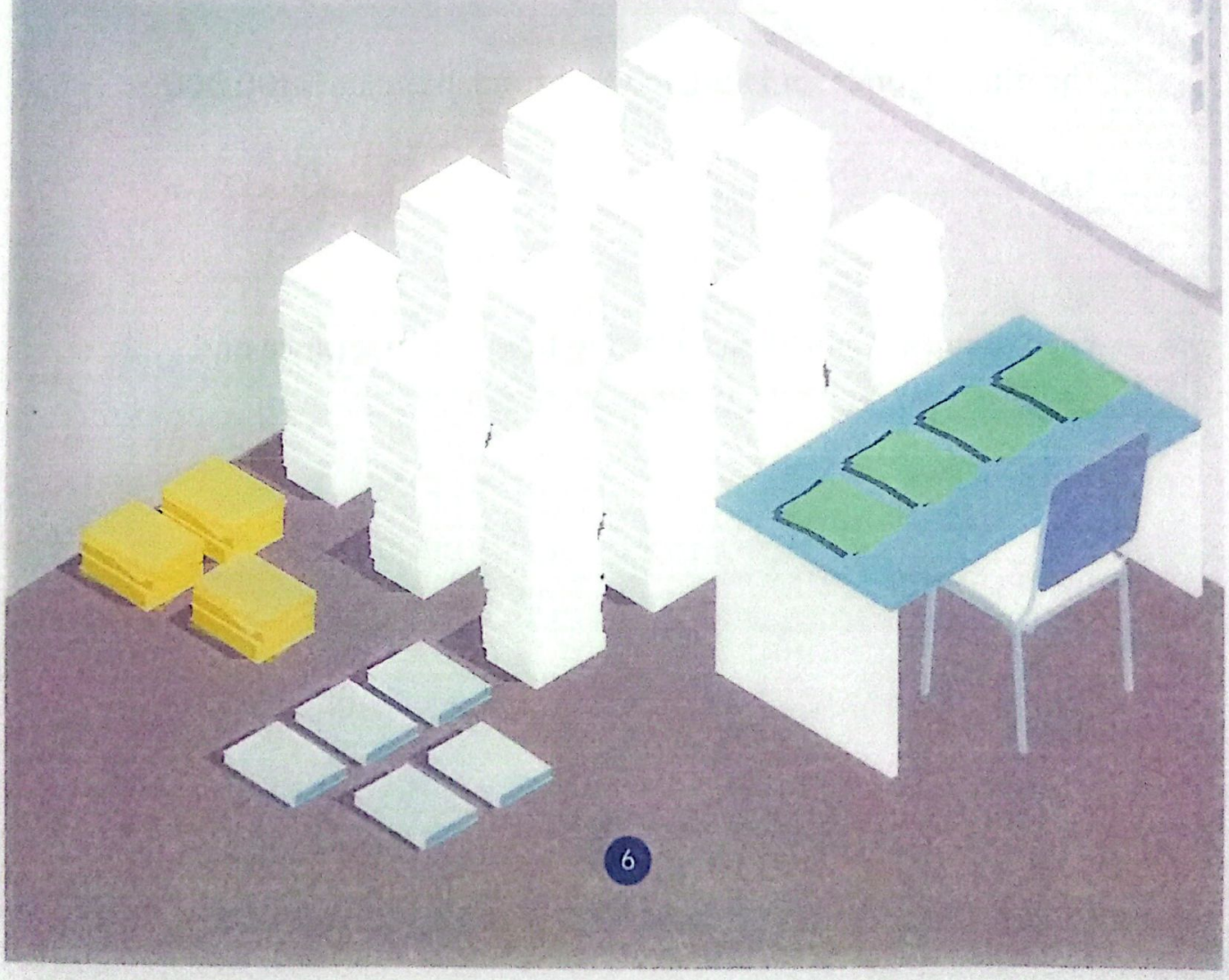
LESSON 1 NUMBERS TO 1,000,000

OBJECTIVES

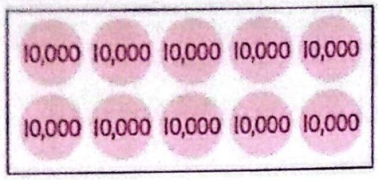
- Read and write multi-digit numbers to 1,000,000 using base-ten numerals, number names, and expanded forms.
- Determine the place value of a digit in a multi-digit number.

THINK

A school ordered 12 stacks of 10,000 white papers, 3 stacks of 1,000 yellow papers, 5 stacks of 100 lavender papers, and 4 stacks of 10 green papers.
How many papers did the school order in all?



LEARN



→ 10 stacks of 10,000 contain 100,000 white papers.

Thousands			Ones		
Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
1	2	3	5	4	0
100,000	10,000 10,000	1,000 1,000 1,000	100 100 100 100 100	10 10 10 10	

The digit 1 stands for 1 hundred thousand. Its value is 100,000.

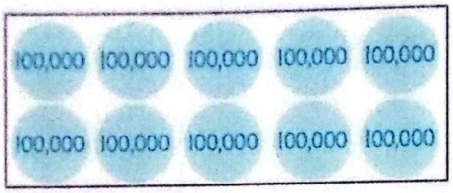
100,000 + 20,000 + 3,000 + 500 + 40 is the expanded form of 123,540.

Each group of three digits, starting from the ones place and separated by commas, is called a period.

Thousands Period | Ones Period

1 2 3, 5 4 0 → one hundred twenty-three thousand, five hundred forty

So, the school ordered _____ papers in all.



→ 10 hundred thousands make one million.

999,999 + 1 = 1,000,000

PRACTICE

A. Use the place value chart to complete the following.

Thousands			Ones		
Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
1	4	3	1	5	6
100,000	10,000 10,000 10,000 10,000	1,000 1,000 1,000	100	10 10 10 10 10	1 1 1 1 1 1

1. The number shown by the place value chart is _____.

2. The digit 3 in this number stands for _____.

3. The value of the digit in the ten thousands place is _____.

4. The period of the digit 4 is the _____.

5. Write the expanded form of the given number.

_____

B. Write the value of each underlined digit.

1. 5̲21,063: _____ 2. 73̲2,242: _____

3. 2̲30,780: _____ 4. 800,1̲37: _____

C. Write the missing numbers.

1. _____ = 500,000 + 80,000 + 3,000 + 100 + 90 + 7

2. 230,004 = _____ hundred thousands + _____ + 4

3. 1,000,000 = _____ ten thousands

D. Write the number in numerals.

1. three hundred thousand, four hundred sixty-seven: _____

2. eight hundred thirty-two thousand, one: _____

3. nine hundred thousand, fifty: _____

E. Write the number in words.

1. 361,254: _____

_____

2. 101,889: _____

_____

3. 506,000: _____

_____

F. Lyn wrote two numbers: ninety-one thousand, eight hundred twenty-five and 771,691 on the whiteboard.
Which of the two numbers has a greater value in the ten thousands place?

_____

_____

G. Continue the pattern.
Write the rule that describes the pattern.

165,700 ; 175,700 ; 185,700 ; _____ ; _____ ; _____

Rule: _____

H. Word Problems

1. A donation project received six hundred thousand dollars, seven thousand dollars, and eight hundred dollars.
   What is the total amount received?

   _____

   _____

2. Two educational videos have been released on a popular YouTube channel.
   Video 1: How to Face Bullies in School
   Video 2: Eating Healthier at School
   Let's track the views for each video over the first week:

Day	Video 1	Video 2
1	900,000	700,000
2	90,000	80,000
3	9,000	10,000
4	900	1,000
5	90	100
6	9	10
7	1	1

   Which video reached a total of 1,000,000 views?

   _____

   _____

   _____

OBJECTIVE

- Compare and order multi-digit numbers using place value.

THINK

In July, 617,459 people visited a water park, and 619,286 people visited it in August.
Which month had the greater number of visitors?



LEARN

July	August
617,459 visitors	619,286 visitors
600,000	600,000
10,000	10,000
7,000	9,000
400	200
50	80
9	6

Start by comparing the digits in the highest place value.

617,459 and 619,286 have the same number of digits.

Both numbers have the same digits in the hundred thousands and ten thousands places. Compare the digits in the thousands place.



7 thousands is less than 9 thousands.

So, 617,459 < 619,286.

Then _____ had the greater number of visitors.

If two numbers have a different number of digits, then the number with more digits is greater.

LESSON 2

PRACTICE

A. Write the numbers in the place value chart. Then compare the numbers using <, >, or =.

1.

Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
3	0	6	2	5	4
5	7	3	7	5	4

306,254 ◯ 573,754

2.

Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones

204,150 ◯ 97,897

3.

Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones

460,104 ◯ 460,940

B. Compare. Write <, >, or = in the ◯.

1. 81,365 ◯ 78,023

2. 75,205 ◯ one million

3. 700,000 + 50,000 + 500 + 9 ◯ 750,059

4. 20 ten thousands + 600 ◯ 200,000 + 60 tens

C. Locate the numbers on the number line. Then order the numbers from greatest to least.

63,500	78,500	87,000	55,000	78,000



_____ > _____ > _____ > _____ > _____

D. 1. Order the numbers from least to greatest.

836,562 863,652 86,652 863,526 836,526

_____ < _____ < _____ < _____ < _____

2. Fill in the blanks with two numbers from Part D. 1.

_____ < 836,540 < _____

E. Circle the numbers that are greater than 187,000.

1,000,000 19,875 189,100 180,314 190,875

F. Guess the number.
Use the clues to find me.

Clue 1: I am between 31,000 and 32,000.
Clue 2: My hundreds digit is 1 less than my ten thousands digit.
Clue 3: My ones digit is 4.
Clue 4: The sum of my digits is 10.
Who am I?

_____

G. Write three numbers that are greater than 460,000 and less than 461,000.

_____ _____ _____

H. Word Problem

The table below shows the number of newborns in four cities within a year.

City	Number of Newborns
A	190,576
B	99,893
C	213,056
D	109,632

a. Which city has a higher number of newborns, City A or City D?

_____

b. Which city has the least number of newborns?

_____

c. Which city has the greatest number of newborns?

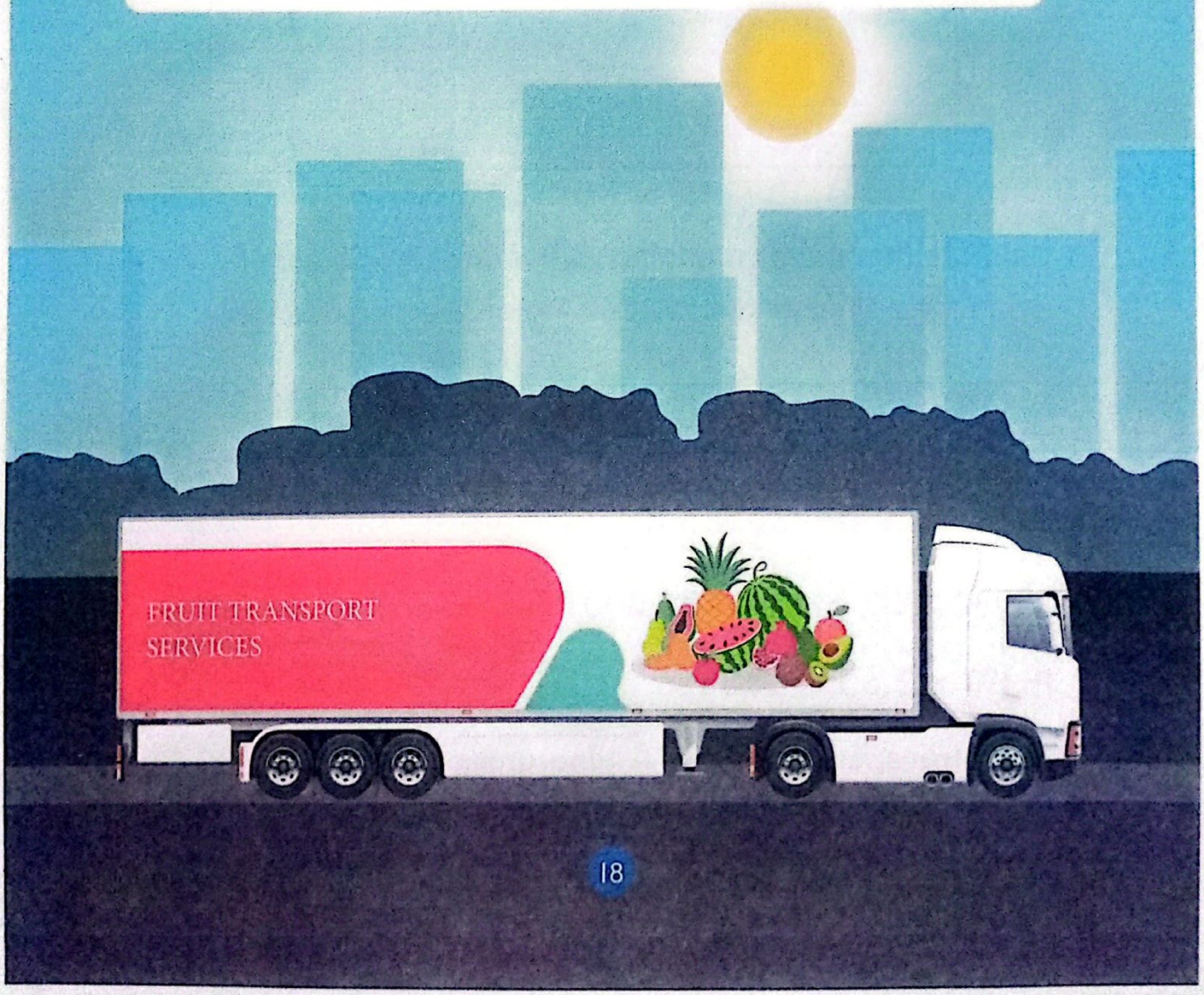
_____

OBJECTIVES

- Add multi-digit numbers using place value.
- Estimate sums using rounding.

THINK

A freight truck driver transported 18,197 kg of watermelon and 13,635 kg of pineapple.
How many kilograms of fruit did he transport in all?



LEARN

- Find 18,197 + 13,635.

Step 1: Arrange the numbers one below the other.

Step 2: Start adding from the ones place. Regroup if needed.

Ten Thousands	Thousands	Hundreds	Tens	Ones
1		1	1	
1	8	1	9	7
+ 1	3	6	3	5
3	1	8	3	2

- Estimate the sum by rounding 18,197 and 13,635 to the nearest ten thousand to check if the answer is reasonable.

$$\begin{array}{rcl} 18,197 & \longrightarrow & 20,000 \\ +\ 13,635 & \longrightarrow & +\ 10,000 \\ \hline & & 30,000 \end{array}$$

Since 31,832 is close to 30,000, the answer is reasonable.

18,197 + 13,635 = 31,832

So, he transported _____ kilograms of fruit in all.

LESSON 3

PRACTICE

A. Round to the place value of the underlined digit.

1. 2 3,1 6 4: _____

2. 1 7 3,2 0 9: _____

3. 1 9,5 6 7: _____

4. 2 3 5,4 8 8: _____

B. Estimate by rounding to the nearest thousand. Then find the sum.

1. 53,506 + 32,397 = 85,903

Estimate:

54,000 + 32,000 = 86,000

```
   1 1
  5 3,5 0 6
+ 3 2,3 9 7
-----------
  8 5,9 0 3
```

2. 20,793 + 45,928 = _____

Estimate:

_____ + _____ = _____

```
  2 0,7 9 3
+ 4 5,9 2 8
-----------
```

3. 56,354 + 22,901 = _____

Estimate:

_____ + _____ = _____

```
  5 6,3 5 4
+ 2 2,9 0 1
-----------
```

C. Karim and Jana rounded 365,498 to the nearest ten thousand. Karim wrote 370,000, and Jana wrote 360,000. Whose answer is correct? Explain.

D. Find the missing digits.

1.
$$\begin{array}{r} \square\,5,\square\square\,0 \\ +\,4\square,\,4\;\;1\;\square \\ \hline 7\;\;2,\,7\;\;3\;\;5 \end{array}$$

2.
$$\begin{array}{r} 1\;\square,\,2\;\square\square \\ +\,\square\;8,\,\square\;5\;\;1 \\ \hline 5\;\;1,\,3\;\;6\;\;0 \end{array}$$

E. Lyn said, "If we add 324,254 and 178,320, we get a total of 492,574."
Is Lyn right? Justify.

Operation

F. Word Problems

Operation

1. In the final stage of an admission exam, all students were graded only with A or B. 82,853 students got A grades, and 15,963 students got B grades.

   a. How many students were tested in the final stage?

   _____

   b. Estimate the total number of students by rounding to the nearest ten thousand.

   _____

   c. Use the estimation to check if the answer is reasonable.

   _____

   _____

Operation

2. In a store, there are 12,576 sacks of wheat, 19,138 sacks of pulses, and 9,876 sacks of rice. How many sacks are there in the store?

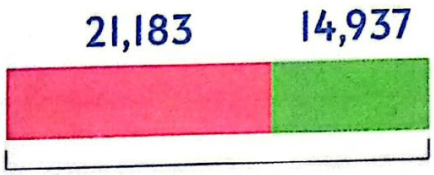
   _____

   _____

3. A factory produces 21,315 orange juice bottles on Monday and 17,860 orange juice bottles on Tuesday.
To the nearest thousand, how many orange juice bottles does the factory produce during the two days?

4. In a city, there are 21,183 female primary teachers and 14,937 male primary teachers.
Let a be the total number of primary teachers in the city.
Find the value of the unknown number a.

Operation



a

LESSON 4 SUBTRACTION OF MULTI-DIGIT NUMBERS

OBJECTIVES

- Subtract multi-digit numbers using place value.
- Use addition to check subtraction.
- Estimate differences using rounding.

THINK

During the summer vacation, Karim biked 12,998 meters, and Jad biked 19,112 meters.
How many more meters did Jad bike than Karim?



LEARN

- Find 19,112 - 12,998.

Start subtracting from the ones place. Regroup if needed.

Ten Thousands	Thousands	Hundreds	Tens	Ones
	8	10	10	12
1	~~9~~	~~1~~	~~1~~	~~2~~
- 1	2	9	9	8
0	6	1	1	4

- Use addition to check subtraction.

$$\begin{array}{r} 19,112 \\ -\ 12,998 \\ \hline 6,114 \end{array} \qquad \begin{array}{r} {\scriptstyle 1\ 1\ 1} \\ 12,998 \\ +\ 6,114 \\ \hline 19,112 \end{array}$$

So, 19,112 - 12,998 = 6,114.

Therefore, Jad biked _____ more meters than Karim.

- Estimate the difference by rounding 19,112 and 12,998 to the nearest thousand.

$$\begin{array}{rcl} 19,112 & \longrightarrow & 19,000 \\ -\ 12,998 & \longrightarrow & -\ 13,000 \\ \hline & & 6,000 \end{array}$$

Jad biked about 6,000 more meters than Karim.

LESSON 4

PRACTICE

A. Estimate using rounding to the nearest thousand. Then find the difference.

1. 82,357 - 51,923 = 30,434

Estimate:

82,000 - 52,000 = 30,000

```
  1 13
  8 2,3 5 7
- 5 1, 9 2 3
-----------
  3 0, 4 3 4
```

2. 136,500 - 99,624 = _____

Estimate:

_____ - _____ = _____

```
  1 3 6, 5 0 0
-   9 9, 6 2 4
-------------
```

3. 387,234 - 125,162 = _____

Estimate:

_____ - _____ = _____

```
  3 8 7, 2 3 4
- 1 2 5, 1 6 2
-------------
```

B. Find the unknown number.

1. 7 5, 6 2 4
   - ☐
   ---
   4 9, 4 7 1

2. ☐
   - 1 3 6, 0 3 0
   ---
   1 1 2, 5 9 4

C. 1. Guess the number.
I am 87,032 less than 135,789.
Who am I?

_____

_____

2. Use addition to check the answer.

_____

Operations

D. Continue the pattern.
Write the rule that describes the pattern.

586,082; 566,082; 546,082; _____; _____; _____

Rule: _____

E. Word Problems

Operation

1. A realtor bought a house for $591,980 and sold it for $619,570.
   a. How much money did he make from this sale?

   _____

   _____

   b. Estimate the difference using rounding to the nearest ten thousand.

   _____

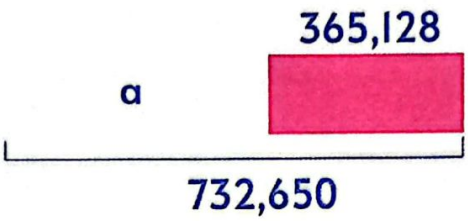
   c. How do you know your answer is reasonable?

   _____

   _____

Operations

2. A chocolate factory makes 732,650 chocolate bars. There are 365,128 bars of white chocolate, and the rest are dark chocolate.
Let a be the number of the dark chocolate bars.



a. Find the value of the unknown number a.

b. Check the answer using addition.

3. For emergency aid, a charity organization received 459,674 donations in January and 311,251 donations in February.
To the nearest ten thousand, how many more donations did the charity organization receive in January than in February?

LESSON 5 MULTIPLICATION COMPARISONS

OBJECTIVES

- Solve comparison problems using multiplication.
- Use rectangular arrays and distributive property to find products.
- Use place value and partial products to solve multiplication equations.
- Multiply tens, hundreds, and thousands using mental math.

THINK

Lyn has $12.
Jana has 3 times as many dollars as Lyn.
How many dollars does Jana have?



LEARN

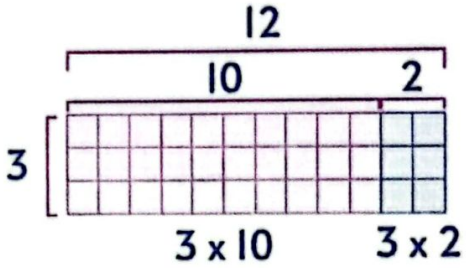
Find 3 x 12.

Lyn | 12 |

Jana | 12 | 12 | 12 |

One way: Use a rectangular array and distributive property.

Draw an array to show 3 x 12.



Break apart 12 into tens and ones.

$3 \times 12 = 3 \times (10 + 2)$
$= (3 \times 10) + (3 \times 2)$
$= 30 + 6$
$= 36$

Distributive property: $3 \times (10 + 2) = (3 \times 10) + (3 \times 2)$

Another way: Use place value and partial products.

$$\begin{array}{r} 12 \\ \times \quad 3 \\ \hline 30 \\ +\quad 6 \\ \hline 36 \end{array}$$

30 ← 3 x 1 ten = 3 tens = 30

6 ← 3 x 2 ones = 6 ones = 6

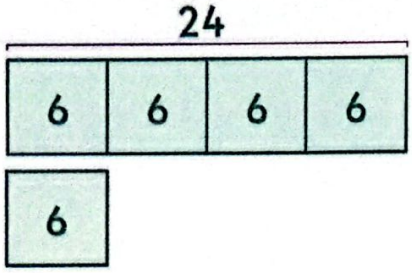
36 ← Add the partial products.

3 x 12 = 36 So, Jana has $ _____ .

PRACTICE

A. Describe each model. Complete the following.

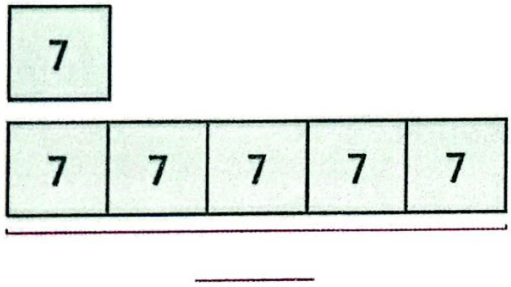
1.



24 is 4 times as many as _____.

24 = _____ x _____

2.

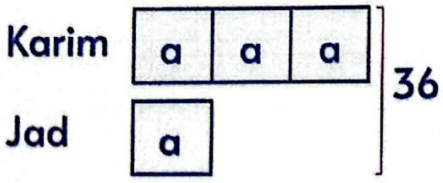


_____

_____ times as many as _____ is _____.

_____ x _____ = _____

B. Karim and Jad have 36 stickers in total. Karim has 3 times as many stickers as Jad. How many stickers does Jad have? Let a represent the number of stickers Jad has.



_____ x a = 36

a = _____

So, Jad has _____ stickers.

C. Multiply tens, hundreds, and thousands using mental math.

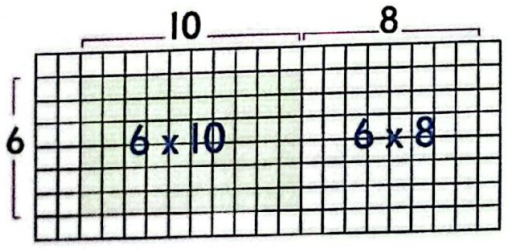
1. $5 \times 80 =$ 5 x 8 tens
   = 40 tens
   = 400

2. $4 \times 700 =$ ____ x ____ hundreds
   = ____ hundreds
   = ____

3. $6 \times 9{,}000 =$ ____ x ____ thousands
   = ____ thousands
   = ____

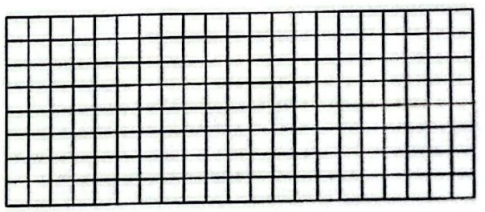
D. Model the product on the grid. Find the product.

1. $6 \times 18 =$ 108



60 + 48 = 108

2. $4 \times 17 =$ ____



____ + ____ = ____

E. Use place value and partial products to find the product.

1. $2 \times 134 =$ _____

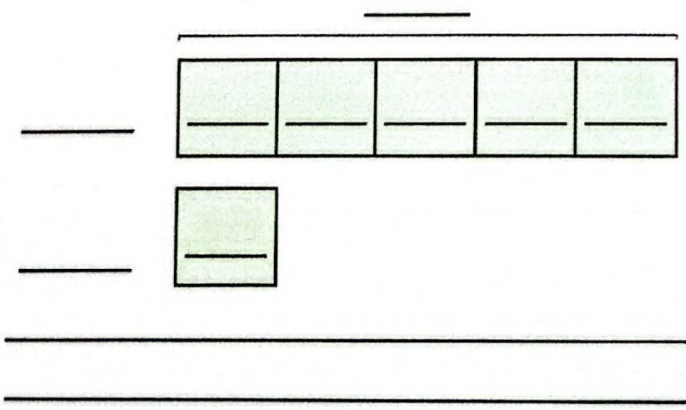
$$\begin{array}{r} 134 \\ \times \quad 2 \\ \hline \square \leftarrow 2 \times 100 \\ \square \leftarrow 2 \times 30 \\ +\ \square \leftarrow 2 \times 4 \\ \hline \square \end{array}$$

2. $4 \times 275 =$ _____

$$\begin{array}{r} 275 \\ \times \quad 4 \\ \hline \square \\ \square \\ +\ \square \\ \hline \square \end{array}$$

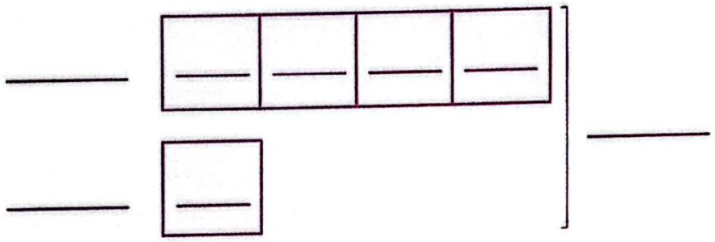
F. Word Problems

1. A scooter costs 5 times as much as a kite. The scooter costs $45. Let n represent the price of the kite. Complete the bar model. Then write an equation and solve it to find the value of the unknown number n.



2. At the beach, Jana collected 4 times as many shells as Karim. Jana and Karim collected 50 shells altogether. Let e represent the number of shells Karim collected.

   How many shells did Jana collect? Complete the model. Then solve the problem.



3. On a farm, there are 7 times as many chickens as rabbits. There are 13 rabbits. How many chickens are there? Use place value and partial products to find the answer.

Operation

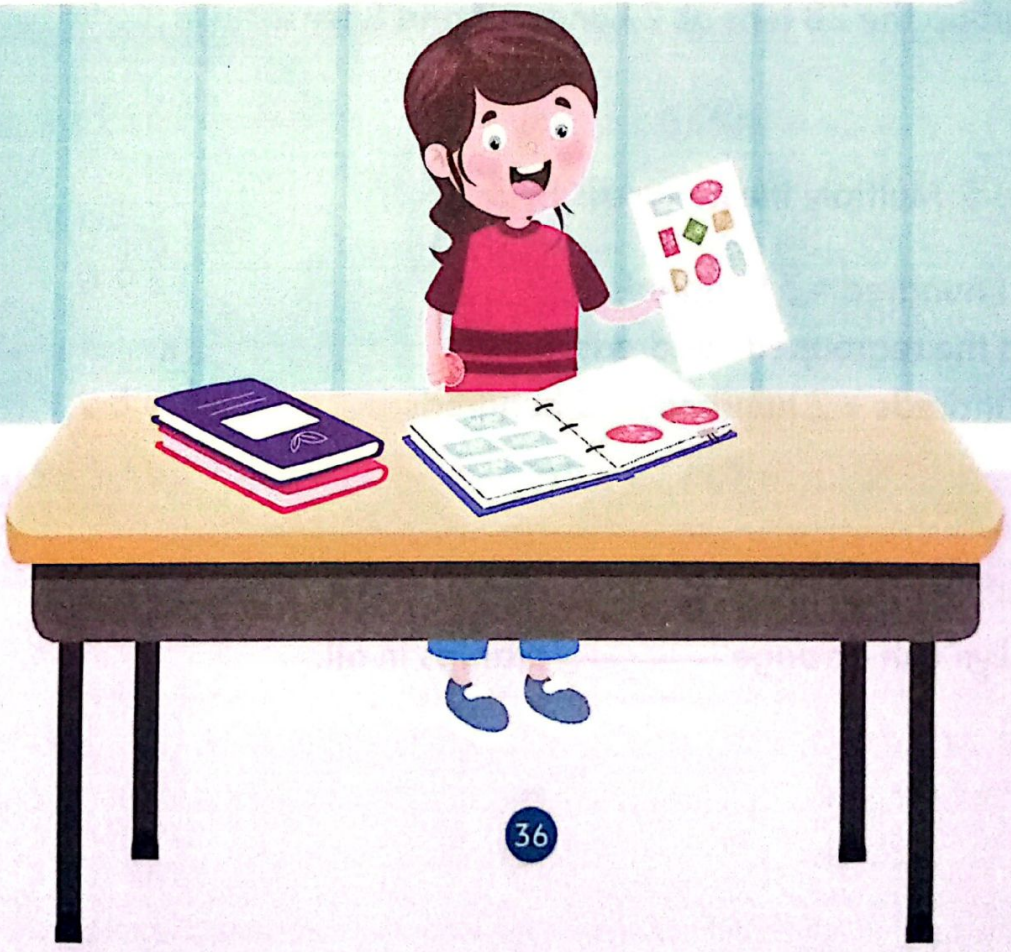
LESSON 6 MULTIPLY BY 1-DIGIT NUMBERS

OBJECTIVES

- Multiply 3-digit and 4-digit numbers by 1-digit numbers with regrouping.
- Estimate products by 1-digit numbers using rounding.
- Find products using mental math strategies.

THINK

Lyn has 3 albums, and she wants to arrange 194 stamps in each album.
How many stamps can Lyn arrange in all?



LEARN

- Find 3 x 194.

Step 1: Multiply the ones by 3.

3 x 4 ones = 12 ones
Regroup the 12 ones as 1 ten and 2 ones.

$$\begin{array}{r} {\scriptstyle 1}\,{\scriptstyle 1} \\ 194 \\ \times\ \ 3 \\ \hline 2 \end{array}$$

Step 2: Multiply the tens by 3.

3 x 9 tens = 27 tens
Add the regrouped tens.
27 tens + 1 ten = 28 tens
Regroup the 28 tens as 2 hundreds and 8 tens.

$$\begin{array}{r} {\scriptstyle 2}\,{\scriptstyle 1} \\ 194 \\ \times\ \ 3 \\ \hline 82 \end{array}$$

Step 3: Multiply the hundreds by 3.

3 x 1 hundred = 3 hundreds
Add the regrouped hundreds.
3 hundreds + 2 hundreds = 5 hundreds

$$\begin{array}{r} {\scriptstyle 2}\,{\scriptstyle 1} \\ 194 \\ \times\ \ 3 \\ \hline 582 \end{array}$$

3 x 194 = 582

So, Lyn can arrange _____ stamps in all.

PRACTICE

A. Estimate the product by rounding the greater factor to the place of the underlined digit.

1. $6 \times \underline{1}23$

   6 x 100 = 600

2. $5 \times \underline{3}72$

   ____ x ____ = ____

3. $4 \times \underline{8}42$

   ____ x ____ = ____

4. $9 \times \underline{2},751$

   ____ x ____ = ____

B. Find the product.

1. $4 \times 1{,}532 =$ 6,128

   ```
     2 1
     1,5 3 2
   x       4
   ---------
     6,1 2 8
   ```

2. $5 \times 673 =$ ____

   ```
       6 7 3
   x       5
   ---------
   ```

3. $3 \times 2{,}483 =$ ____

   ```
     2,4 8 3
   x       3
   ---------
   ```

4. $6 \times 1{,}642 =$ ____

   ```
     1,6 4 2
   x       6
   ---------
   ```

C. Multiply mentally.

$4 \times 25 = 100$



1. $(4 \times 5) \times 25 = \underline{(5 \times 4) \times 25}$ ← Commutative Property

   $= \underline{5 \times (4 \times 25)}$ ← Associative Property

   $= _____$

   $= _____$

Associative property:
$(5 \times 4) \times 25 = 5 \times (4 \times 25)$

2. $25 \times (7 \times 4) = _____$

   $= _____$

   $= _____$

   $= _____$

D. Multiply mentally using the addition or subtraction strategy.

1. $4 \times 325 = \underline{4 \times (300 + 25)}$ ← Think: 325 is close to 300.

   $= \underline{(4 \times 300) + (4 \times 25)}$

   $= _____$

   $= _____$

2. $525 \times 2 = _____$

   $= _____$

   $= _____$

   $= _____$

3. $5 \times 498 = 5 \times (500 - 2)$ ← Think: 498 is close to 500.

$= (5 \times 500) - (5 \times 2)$

$=$ _____

$=$ _____

4. $299 \times 3 =$ _____

$=$ _____

$=$ _____

$=$ _____

E. Word Problems

1. A farmer planted 3 rows of flower seeds in his garden. In each row, he sowed 197 seeds.
   a. How many seeds did he sow in all rows?

   _____

   _____

   b. Use estimation to check if the answer is reasonable.

   _____

   _____

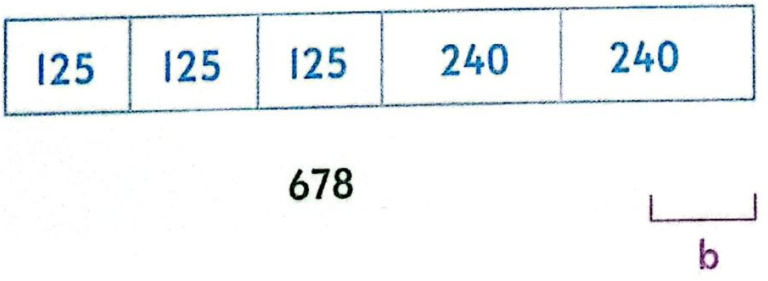
   _____

Operation

2. A grocery store orders 4 boxes, each box containing 6 crates of peaches. Each crate has 25 peaches. How many peaches does the store receive in total? Use mental math to solve.

3. A factory produces 3 batches of 125 chocolate chip cookies each and 2 batches of 240 macaron cookies each.
The factory sells 678 cookies.
Let b represent the number of cookies remaining.
Find the value of the unknown number b.

Operations



LESSON 7 MULTIPLY TWO 2-DIGIT NUMBERS

OBJECTIVES

- Multiply two 2-digit numbers with regrouping.
- Multiply two 2-digit numbers using area models and partial products.
- Multiply by tens mentally.
- Estimate products by 2-digit numbers using compatible numbers.

THINK

Karim is preparing for a mental math contest. Each day, he practices for 32 minutes.
How many minutes does Karim practice in 14 days?



LEARN

- Find 14 x 32.

Think of 32 as 3 tens and 2 ones.

Step 1: Multiply 14 by 2 ones.

2 x 4 ones = 8 ones
2 x 1 ten = 2 tens

$$\begin{array}{r} 14 \\ \times\ 32 \\ \hline 28 \end{array} \leftarrow 2 \times 14$$

Step 2: Multiply 14 by 3 tens.

30 x 4 ones = 120 ones = 12 tens
Regroup 12 tens as 1 hundred and 2 tens.
30 x 1 ten = 30 tens = 3 hundreds
Add the regrouped hundreds.
3 hundreds + 1 hundred = 4 hundreds

$$\begin{array}{r} {\scriptstyle 1} \\ 14 \\ \times\ 32 \\ \hline 28 \\ 420 \end{array} \leftarrow 30 \times 14$$

Step 3: Add the partial products.

28 + 420 = 448

$$\begin{array}{r} {\scriptstyle 1} \\ 14 \\ \times\ 32 \\ \hline 28 \\ +\ 420 \\ \hline 448 \end{array}$$

14 x 32 = 448

So, Karim practices _____ minutes in 14 days.

PRACTICE

A. Use the area model to find the product. Break apart the factors into tens and ones to show the partial products. Then add them to find the product.

1. 32 x 54 = 1,728

	50	4
30	30 x 50	30 x 4
2	2 x 50	2 x 4

1,500 + 120 + 100 + 8 = 1,728

2. 23 x 47 = _____

	_____	_____
_____	_____	_____
_____	_____	_____

B. Multiply by tens mentally.

1. 40 x 30 = 40 x 3 tens
   = 120 tens
   = 1,200

2. 70 x 80 = _____ x _____ tens
   = _____ tens
   = _____

3. 50 x 60 = _____ x _____ tens
   = _____ tens
   = _____

C. Find the product.

1. 32 x 48 = _____

```
  32
x 48
----
```

2. 19 x 74 = _____

```
  19
x 74
----
```

D. Estimate the product using compatible numbers.

Compatible numbers are easy to compute mentally and are close to the given numbers.

15 x 3 = 45
15 x 6 = 90



1. 14 x 62

   Estimate: 15 x 60 = 900

2. 24 x 41

   Estimate: ____ x ____ = ____

3. 26 x 78

   Estimate: ____ x ____ = ____

E. Word Problems

1. A theater has 21 rows of 38 seats each.

   About how many seats does the theater have?

   _____

   _____

2. Each of the 23 classes of an elementary school collected 84 cans for recycling.
What was the number of cans collected?

Operation

3. In a class of 29 students, a teacher raised money for a trip to the museum. The cost was $16 per student.

a. How much did the trip cost for all the students?

Operation

b. Find an estimate for the total cost of the trip using compatible numbers and mental math.

c. Use the estimation to check if the answer is reasonable.

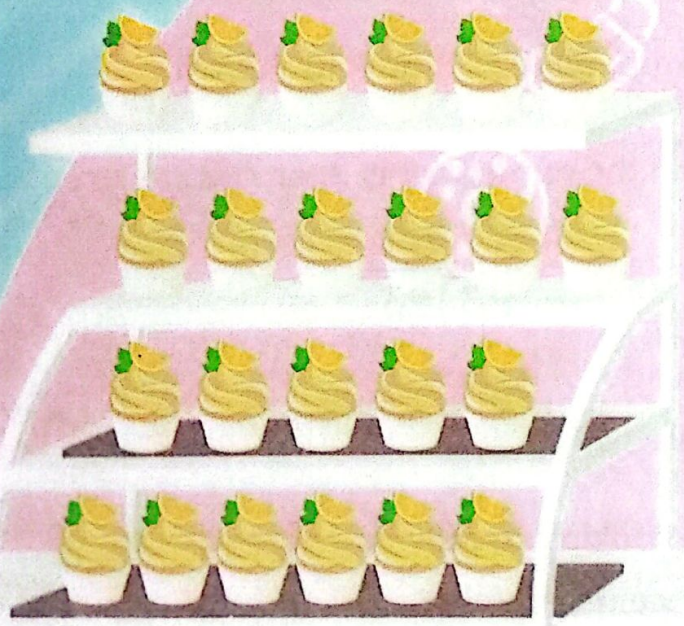
LESSON 8 DIVISION WITH AND WITHOUT REMAINDER

OBJECTIVES

- Use models to solve division problems with and without remainders.
- Use place value and basic facts to mentally divide tens, hundreds, and thousands.

THINK

A baker made 18 oatmeal cookies and 23 lemon cupcakes, which he will distribute equally among his 3 neighbors.
Can he distribute the cookies equally?
Can he distribute the cupcakes equally?

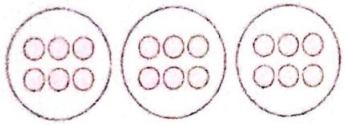




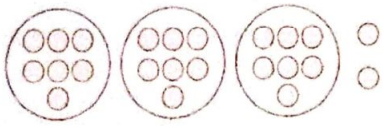
LEARN

Draw 3 circles to represent the neighbors and use counters to represent the 18 cookies or the 23 cupcakes.

- 18 counters form 3 groups of 6 each, with no extra counters.



- 23 counters form 3 groups of 7 each, with 2 extra counters.



Quotient is the number in each group.

Remainder is the number left over after dividing.

For 18 ÷ 3, the quotient is 6, and the remainder is 0.

$18 = 3 \times 6$

Dividend, Divisor, Quotient

write: $3\overline{)18}$ with quotient 6 or $18 \div 3 = 6$

For 23 ÷ 3, the quotient is 7, and the remainder is 2, or 7R2.

$23 = (3 \times 7) + 2$

Dividend, Divisor, Quotient, Remainder

write: $3\overline{)23}$ with quotient $7R2$

The remainder must be less than the divisor.

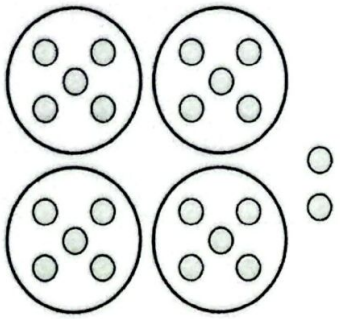
So, he _____ distribute the cookies equally.

He _____ distribute the cupcakes equally.

PRACTICE

A. Complete the following using the model representing the division problem below.

1. $22 \div 4$



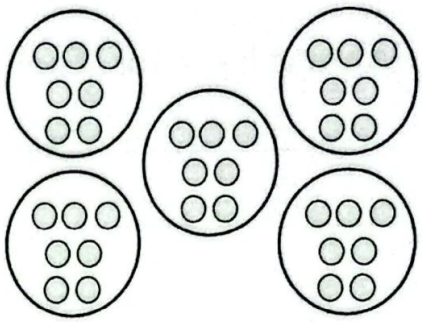
____ groups of ____ each

____ counters left over

Quotient: ____

Remainder: ____

2. $5\overline{)35}$



____ groups of ____ each

____ counters left over

Quotient: ____

Remainder: ____

B. Draw a quick picture to find the quotient and remainder of each division problem.

1. $13 \div 2$

Quotient: ____

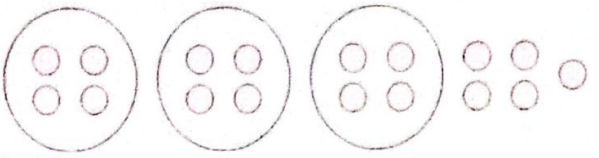
Remainder: ____

2. $3\overline{)27}$

Quotient: ____

Remainder: ____

C. Jana drew the model below and said it represents the division problem 17 ÷ 3.

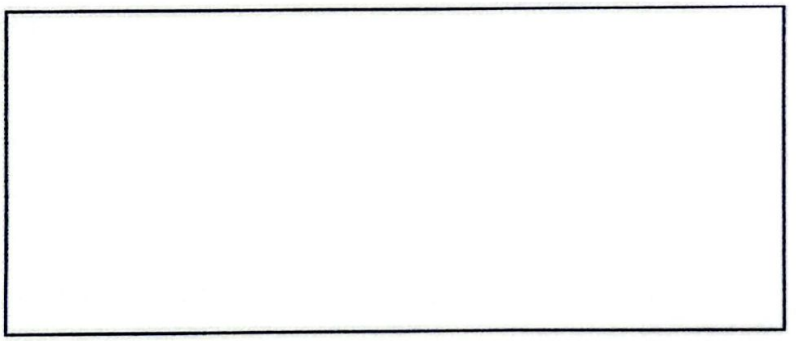


1. What is her error? Explain.

_____

_____

2. Draw the correct model.



D. Use basic facts and place value to divide mentally.

1. 360 ÷ 9 = 40 ← Think: 36 tens ÷ 9 = 4 tens

Basic fact:

36 ÷ 9 = 4 ← Think: 9 x 4 = 36

2. 1,500 ÷ 3 = _____

   Basic fact:

   _____ ÷ _____ = _____

3. 28,000 ÷ 7 = _____

   Basic fact:

   _____ ÷ _____ = _____

E. Jana divided 72 by 4 and got 17R4.
   What clue indicates that her answer is wrong?
   Write the correct answer.

_____

_____

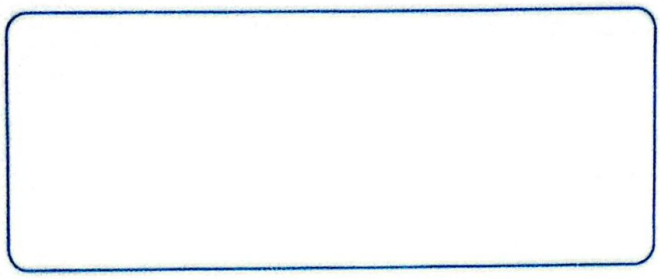
F. Word Problems

1. A tanker truck driver distributed 20,000 liters of petrol equally among 4 petrol stations.
   How many liters of petrol did each station receive?
   Find the answer using mental math.

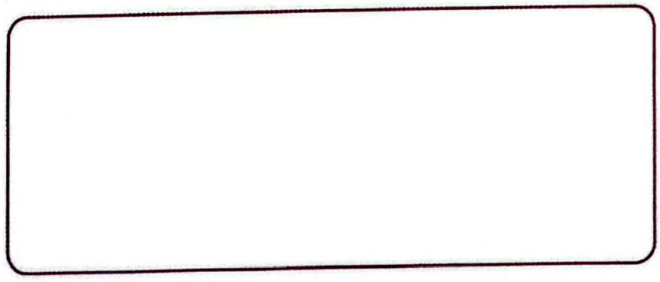
_____

_____

2. The 28 students in a class are going to a soccer game using taxis. Each taxi transports 5 students.
How many taxis are needed for all the 28 students?
Draw a quick picture to find the answer.



3. A merchant sells 35 mangoes in bags, each containing 4 mangoes.
How many bags does he fill, and how many mangoes are left?
Draw a quick picture to find the answer.



LESSON 9 DIVIDE BY 1-DIGIT NUMBERS

OBJECTIVES

- Find quotients and remainders with up to 4-digit dividends and 1-digit divisors with regrouping.
- Check division using multiplication.
- Estimate quotients using compatible numbers.

THINK

Jana bought 162 candy cones to distribute to guests on her birthday. She wants to pack them into boxes with 5 candy cones in each.
How many boxes of candy cones can she fill?
How many candy cones will be left?



LEARN

• Find 162 ÷ 5.

Step 1: Look at the digit in the highest place value to divide.
Here, 1 cannot be shared among 5 groups.
Regroup 1 hundred as 10 tens. Now, there are 16 tens.

Step 2: Divide the tens by 5.

```
   3        3 tens in each group
5 ) 162
  - 15      15 tens used
    1       1 ten left over
```

Step 3: Bring down 2 ones and divide 12 ones by 5.

```
   32R2     2 ones in each group
5 ) 162
  - 15↓
    12
  - 10      10 ones used
    2       2 ones left over
```

• You can use multiplication to check division.

```
   1
   32  ← Quotient          160
 x  5  ← Divisor         +   2  ← Remainder
-----                    -----
  160                     162  ← Dividend
```

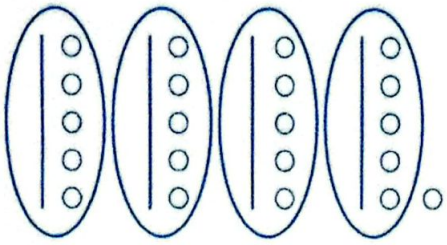
So, 162 ÷ 5 = 32R2.

Then she can fill _____ boxes of candy cones.
_____ candy cones will be left.

PRACTICE

A. Draw a quick picture to divide.

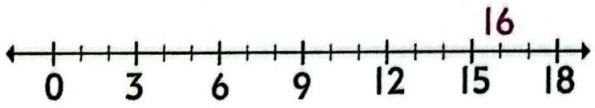
1. $61 \div 4 =$ 15R1



2. $77 \div 3 =$ _____

B. Use compatible numbers to estimate the quotient.

1. $163 \div 3$



Basic fact: 15 ÷ 3 = 5

Estimate: 150 ÷ 3 = 50

16 is closer to 15 than it is to 18.

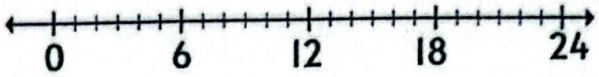
2. $197 \div 4$



Basic fact: _____

Estimate: _____

3. 2,331 ÷ 6



Basic fact: _____

Estimate: _____

C. Divide. Check your answer.

1.
$$2\overline{)684}$$
342
- 6
08
- 8
04
- 4
0

2.
$$5\overline{)175}$$

3.
$$8\overline{)8,403}$$

Check:

342
x 2
684

684 = 342 x 2

Check:

Check:

D. Find the missing digits.

1.
$$\begin{array}{r} 1\square\square \\ 4\overline{)432} \\ -\square\downarrow \\ \hline \square 3 \\ -\square \\ \hline 32 \\ -32 \\ \hline \square \end{array}$$

2.
$$\begin{array}{r} \square\square 4R\square \\ 5\overline{)1,271} \\ -10\downarrow \\ \hline \square 7 \\ -25 \\ \hline \square 1 \\ -\square\square \\ \hline \square \end{array}$$

E. Word Problems

1. A pet store received an order of 135 cans of cat food on Monday and 99 cans on Wednesday. All the cans were distributed equally on 6 shelves.

Operations

a. How many cans are on each shelf?

_____

_____

_____

b. Use multiplication to check the answer.

_____

2. Tarek jogged 2,637 meters in 3 days. He covered the same distance each day.
   About how many meters did he jog each day?

_____

_____

3. A grocery store bought 53 dozen smoothie drink bottles. The store manager wants to arrange these bottles into equal stacks of 8 bottles each.

   1 dozen = 12

   Operations

   a. How many full stacks of eight bottles can he make?

_____

_____

_____

   b. How many bottles are left over?

_____

   c. Check your answer.

_____

LESSON 10 FACTORS AND MULTIPLES

OBJECTIVES

- Recognize factors of a whole number.
- Find all factor pairs for a whole number in the range 1-100.
- Recognize multiples of a whole number.
- Recognize how factors and multiples are related.

THINK

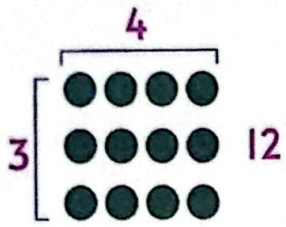
A farmer wants to plant an array of 12 plants in his orchard.
Can he make an array of 3 equal rows?
How many different ways can he use to plant his plants?



LEARN

Try to arrange the 12 plants into 3 equal rows to make an array.

The array has 3 equal rows of 4 with no extra counters.



$12 \div 3 = 4$

3 is a factor of 12 since the remainder is 0.

Whole numbers are numbers that start from 0 and increase by 1.
0, 1, 2, 3, 4, 5, and so on.

A factor is a whole number that divides another whole number evenly, with no remainder.

So, he _____ make an array of 3 equal rows.



$1 \times 12 = 12$

$2 \times 6 = 12$

$3 \times 4 = 12$

Factors of 12 are numbers multiplied to get 12.

Factors of 12: 1, 2, 3, 4, 6, 12

So, he can use _____ different ways to plant his plants.

A multiple of a whole number is the product of that number and another whole number.

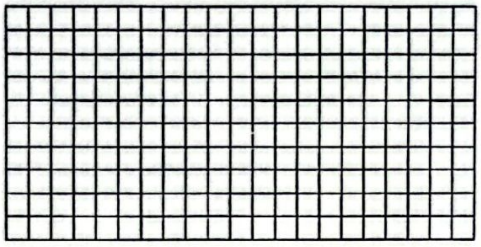
12 is a multiple of each of its factors.

LESSON 10

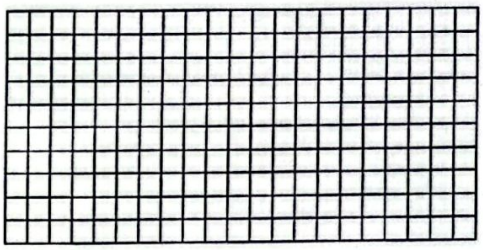
PRACTICE

A. Draw a model to show the following.

1. 3 is a factor of 30.



2. 2 is a factor of 24.



B. List all the factor pairs for the number.

1.

Factors of 16	
1 x 16 = 16	1 ; 16
____ x ____ = ____	____ ; ____
____ x ____ = ____	____ ; ____

2.

Factors of 25	
____ x ____ = ____	____ ; ____
____ x ____ = ____	____ ; ____

C. Use division to answer the following questions. Write Yes or No. Then justify.

1. Is 4 a factor of 48?

$4\overline{)48}$

2. Is 6 a factor of 76?

$6\overline{)76}$

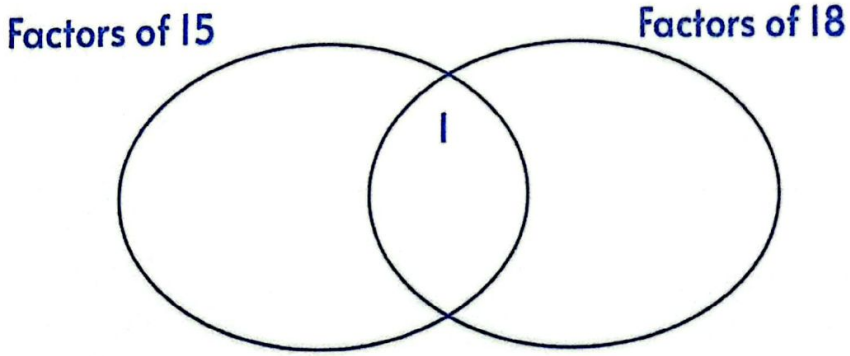
D. 1. List the factors of each number.

Factors of 15: _____

Factors of 18: _____

2. Find the common factors of 15 and 18. _____

3. Complete the Venn diagram.



E. Circle True or False for each statement. Explain.

1. 28 is a multiple of 7. True False

_____

2. 9 is a multiple of 81. True False

_____

F. Multiply to list the next five multiples of the number.

1. Multiples of 5: 0 (0 x 5), ____ (1 x 5), ____ (2 x 5), ____ (3 x 5), ____ (4 x 5), ____ (5 x 5)

2. Multiples of 8: 0, ____, ____, ____, ____, ____

G. Cross out the number that does not belong to the group. Justify.

1. 1 2 5 9 10

_____

2. 0 6 12 18 20 24

_____

H. Word Problems

1. Jad visits the sports club every 3 days, and Adam visits it every 4 days. They met on June 2. Let's find out when they will meet again.

a. Write the next 4 multiples of 3 and 4.



Multiples of 3: 3, ____, ____, ____, ____

Multiples of 4: 4, ____, ____, ____, ____

b. Find the least common multiple of 3 and 4. _____

c. Deduce the next day they will meet again. _____

2. A florist has 35 lilies and 15 daisies. He wants to make identical bouquets, each with the same number of lilies and daisies.
Find the greatest number of bouquets he can make.

a. List the factors of each number.

Factors of 15: _____

Factors of 35: _____

b. Find the common factors of 15 and 35. _____

c. Deduce the greatest number of bouquets he can make.

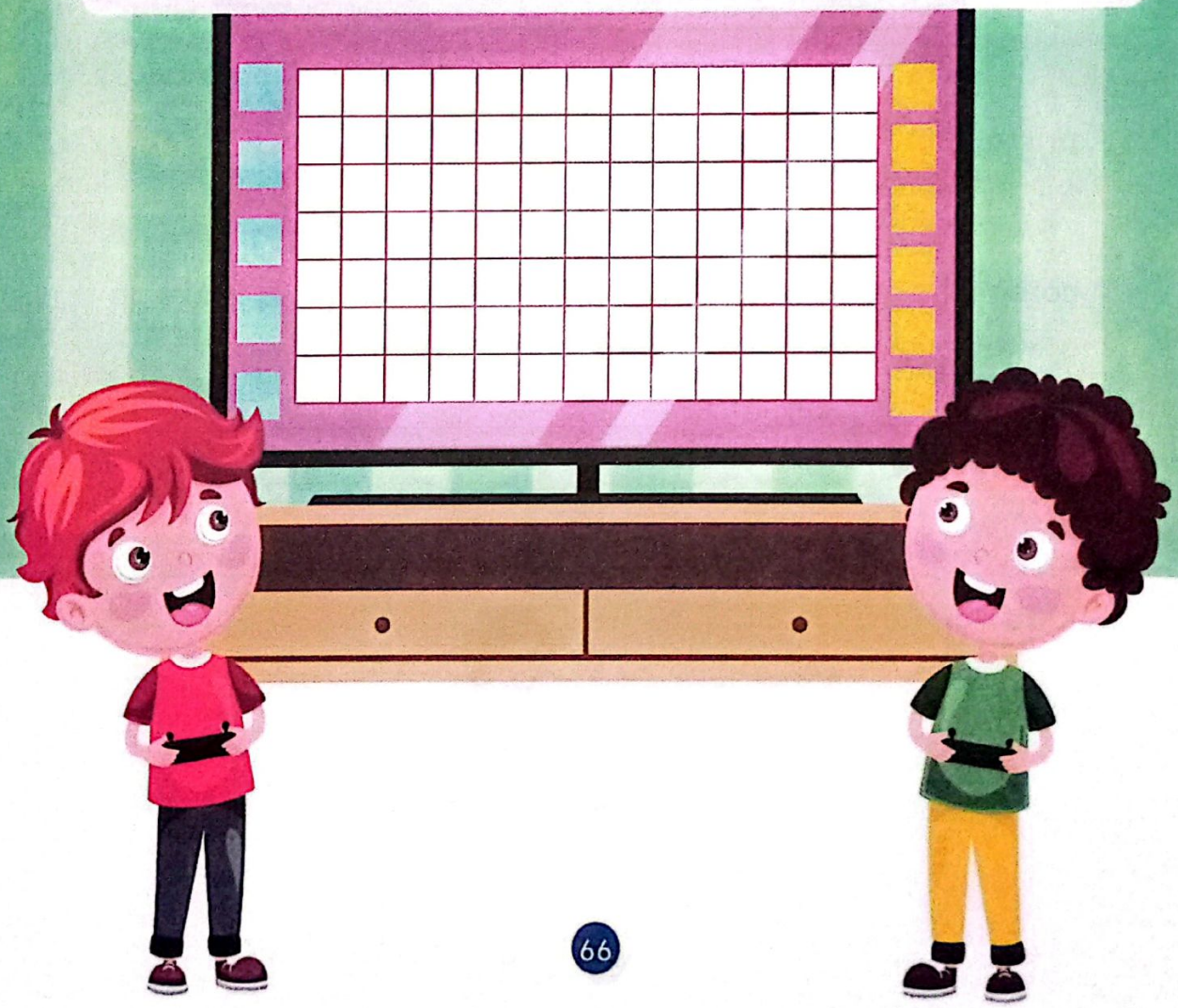
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OBJECTIVES

- Recognize prime numbers.
- Recognize composite numbers.

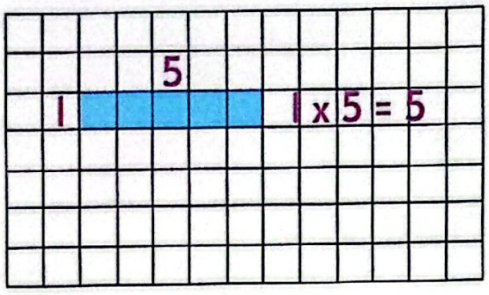
THINK

Adam has 5 blue square tiles, and Jad has 6 yellow square tiles.
Each of them will arrange the tiles to make a rectangle.
In how many different ways can Adam make a rectangle?
In how many different ways can Jad make a rectangle?



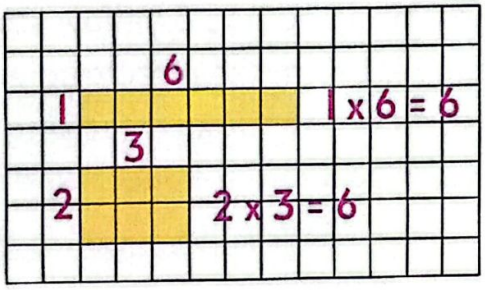
LEARN

Adam



Adam can make a rectangle in _____ way.
Factors of 5: 1, 5
5 is called a prime number.

Jad



Jad can make a rectangle in _____ different ways.
Factors of 6: 1, 2, 3, 6
6 is called a composite number.

A **prime number** is a whole number greater than 1 that has only 2 factors, one and itself.

A **composite number** is a whole number greater than 1 that has more than 2 factors.

Keep this in mind!
Even numbers have 0, 2, 4, 6, or 8 in the ones digit.
Odd numbers have 1, 3, 5, 7, or 9 in the ones digit.

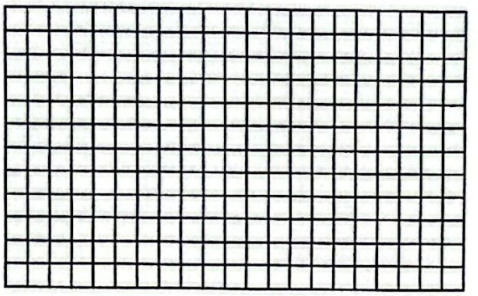
1 is neither prime nor composite since it has only one factor, which is 1.



PRACTICE

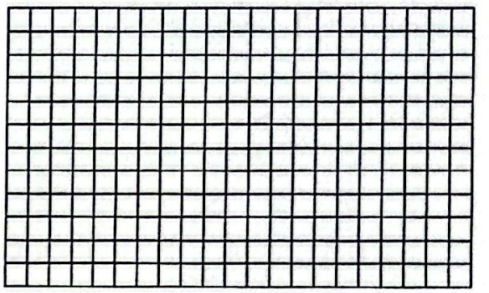
A. Using the grid below, draw a model to list the factors of the given number. Write whether the number is prime or composite.

1. 15



Factors of 15: _____
So, 15 is _____.

2. 13



Factors of 13: _____
So, 13 is _____.

B. Write whether the number is prime or composite. Explain.

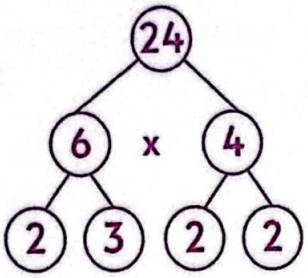
1. 27: _____

2. 17: _____

3. 64: _____

C. Complete the factor tree to decompose the number.
Write whether the number is prime or composite.

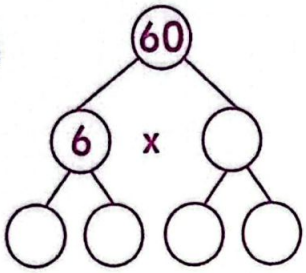
1.



24 = 2 x 3 x 2 x 2

So, 24 is _____.

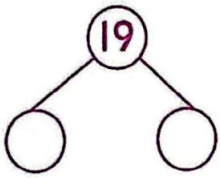
2.



60 = _____ x _____ x _____ x _____

So, 60 is _____.

3.



19 = _____ x _____

So, 19 is _____.

D. Jad says, "All odd numbers are prime, and all even numbers are composite."
Do you agree or disagree? Explain your answer and give examples to support it.

_____

_____

E. Follow the steps below to circle all prime numbers less than 100.

1. Cross out 1 since 1 is not a prime number.
2. Circle the prime number 2 and cross out its multiples.
3. Circle the prime number 3 and cross out its multiples.
4. Circle the prime number 5 and cross out its multiples.
5. Circle the prime number 7 and cross out its multiples.

Eratosthenes' method is used to find all the prime numbers less than 100.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

6. Circle the remaining prime numbers, and then list all the prime numbers less than 100.

_____

_____

F. Karim said that the sum of two prime numbers should be prime.
Lyn said that the product of two prime numbers should be prime.
Do you agree with them? Justify your answer by giving examples.

G. Word Problem

Jad and Karim are playing a game by tossing two dice and then multiplying the numbers obtained.

a. Complete the table.

Product	Possible Faces of Dice
12	
5	
6	
3	



b. Which of the numbers 12, 5, 6, or 3 are prime? Justify.

LESSON 12 EQUIVALENT FRACTIONS

OBJECTIVES

- Use multiplication and division to find equivalent fractions.
- Compare unlike fractions.

THINK

During class break, Karim ate $\frac{1}{2}$ of his chocolate bar, and Jad ate $\frac{6}{8}$ of his chocolate bar.
The bars were of the same size.
Who ate the smaller piece?



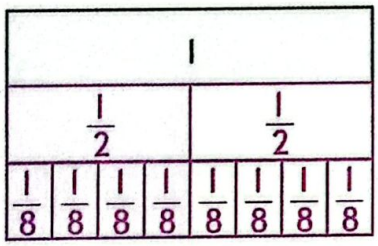
LEARN

- Compare the unlike fractions $\frac{1}{2}$ and $\frac{6}{8}$.

Find an equivalent fraction for $\frac{1}{2}$ that has the same denominator as $\frac{6}{8}$.

Equivalent fractions are fractions that name the same amount of a whole.

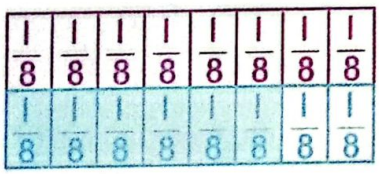
- We can multiply the numerator and the denominator by the same number to find equivalent fractions.



$\frac{1}{2} = \frac{4}{8}$ (×4 above, ×4 below)

$\frac{4}{8}$ and $\frac{6}{8}$ have like denominators.

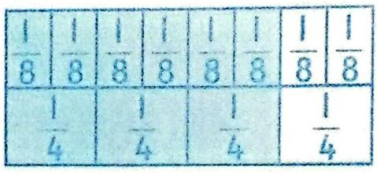
The smaller fraction has the smaller numerator.



$\frac{4}{8} < \frac{6}{8}$, so $\frac{1}{2} < \frac{6}{8}$.

Then _____ ate the smaller piece.

- We can divide the numerator and the denominator by the same number to find equivalent fractions.



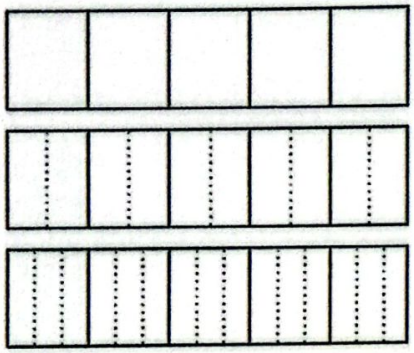
$\frac{6}{8} = \frac{3}{4}$ (÷2 above, ÷2 below)

$\frac{3}{4}$ is the simplest form of $\frac{6}{8}$.



PRACTICE

A. Use models and multiplication to find equivalent fractions.

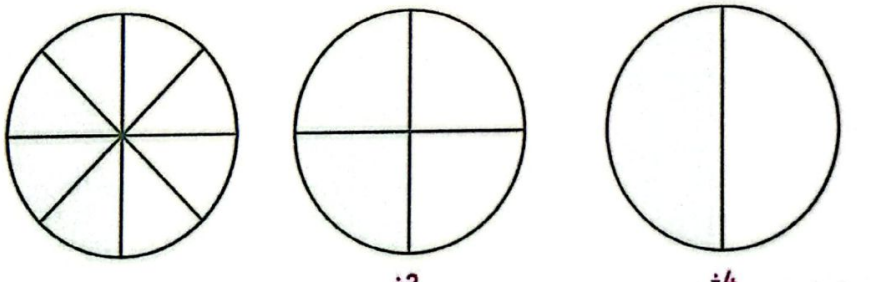


$\frac{1}{5} = \frac{\square}{10}$ (×2)

$\frac{1}{5} = \frac{\square}{15}$ (×3)

So, $\frac{1}{5} = \frac{\square}{\square} = \frac{\square}{\square}$.

B. Use models and division to find equivalent fractions.



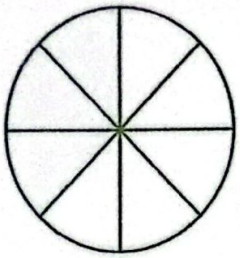
$\frac{4}{8}$

$\frac{4}{8} = \frac{\square}{\square}$ (÷2)

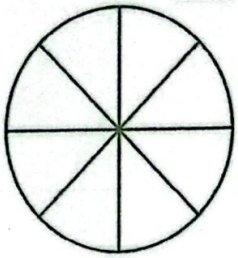
$\frac{4}{8} = \frac{\square}{\square}$ (÷4)

So, $\frac{4}{8} = \frac{\square}{\square} = \frac{\square}{\square}$.

C. 1. Which is greater, $\frac{3}{8}$ or $\frac{1}{2}$? $\frac{\square}{\square}$

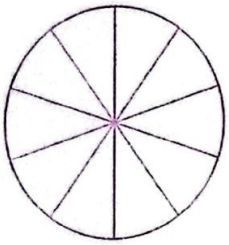


$\frac{3}{8}$

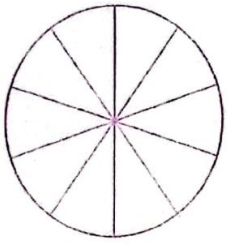


$\frac{1}{2}$

2. Which is less, $\frac{1}{2}$ or $\frac{7}{10}$? $\frac{\square}{\square}$



$\frac{1}{2}$



$\frac{7}{10}$

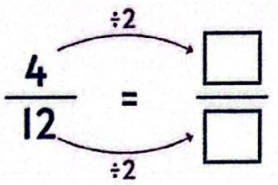
A benchmark fraction is a common fraction used to make comparing other fractions easier.

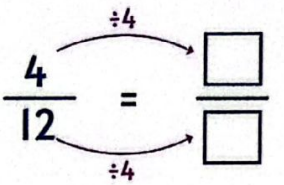
3. Compare the fractions $\frac{3}{8}$ and $\frac{7}{10}$ to the benchmark $\frac{1}{2}$.

$\frac{3}{8} \bigcirc \frac{1}{2}$ $\frac{7}{10} \bigcirc \frac{1}{2}$

4. Use the previous comparison to compare. $\frac{3}{8} \bigcirc \frac{7}{10}$

D. 1. Divide to find equivalent fractions for $\frac{4}{12}$.





2. Complete. The simplest form of $\frac{4}{12}$ is $\frac{\square}{\square}$.

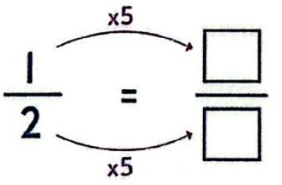
E. Find 3 equivalent fractions for each fraction.

1. $\frac{2}{3} = \frac{\square}{\square} = \frac{\square}{\square} = \frac{\square}{\square}$

2. $\frac{1}{4} = \frac{\square}{\square} = \frac{\square}{\square} = \frac{\square}{\square}$

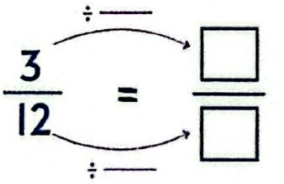
F. Find an equivalent fraction, and then compare using <, >, or =.

1. $\frac{1}{2}$ and $\frac{4}{10}$



So, $\frac{1}{2} \bigcirc \frac{4}{10}$.

2. $\frac{3}{12}$ and $\frac{2}{4}$



So, $\frac{3}{12} \bigcirc \frac{2}{4}$.

G. Tell whether the fractions are equivalent or not. Write = or ≠.

≠: not equal sign

1. $\frac{5}{25} \bigcirc \frac{1}{5}$ 2. $\frac{2}{7} \bigcirc \frac{4}{28}$ 3. $\frac{1}{8} \bigcirc \frac{3}{24}$

H. Word Problems

1. Lyn and Jana are reading the same book about animals. Lyn read $\frac{5}{6}$ of the book. Jana read $\frac{2}{3}$ of the book.

   Who read more?

   _____

   _____

2. Adam and Jad were drinking hot chocolate from identical cups. Adam drank $\frac{4}{5}$ of his cup, while Jad drank $\frac{12}{15}$ of his cup.

   Did they drink the same amount of hot chocolate?

   _____

   _____

OBJECTIVES

- Add fractions with like denominators.
- Subtract fractions with like denominators.

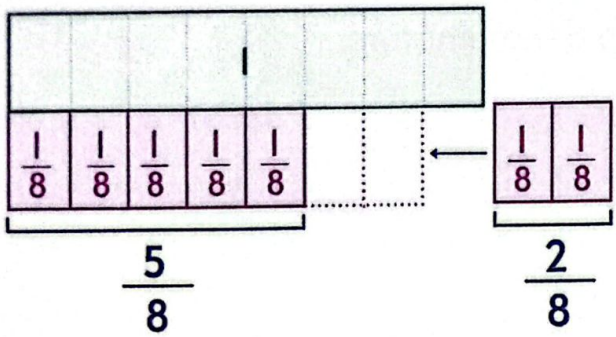
THINK

Adam and Jad got new tablets.
Each tablet started with $\frac{5}{8}$ of its battery charged.
Adam plugged his tablet into the charger, gaining $\frac{2}{8}$ more battery life. Meanwhile, Jad's tablet lost $\frac{3}{8}$ of its battery.
What is the final charge of Adam's tablet?
What is the final charge of Jad's tablet?



LEARN

• Find $\frac{5}{8} + \frac{2}{8}$ using fraction strips.



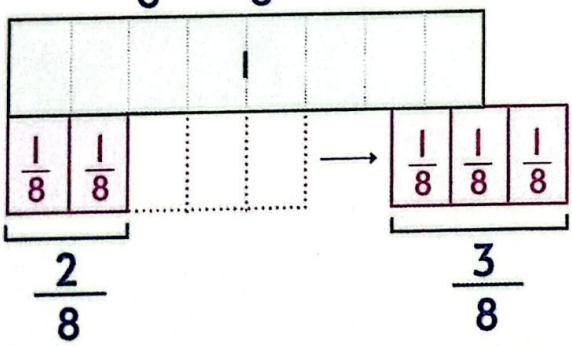
Add the numerators, and then write the sum over the like denominator 8.

5 eighths + 2 eighths
= 7 eighths

$$\frac{5}{8} + \frac{2}{8} = \frac{5+2}{8} = \frac{\square}{8}$$

So, the final charge of Adam's tablet is $\frac{\square}{\square}$.

• Find $\frac{5}{8} - \frac{3}{8}$.



5 eighths - 3 eighths
= 2 eighths

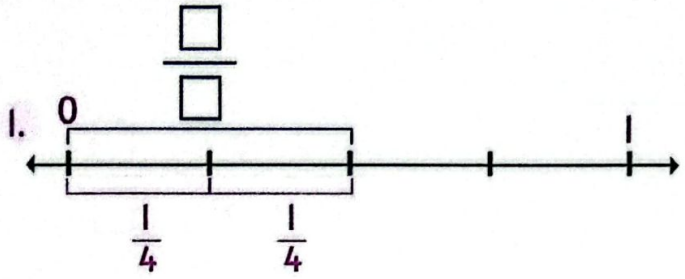
Subtract the numerators, and then write the difference over the like denominator 8.

$$\frac{5}{8} - \frac{3}{8} = \frac{5-3}{8} = \frac{\square}{8}$$

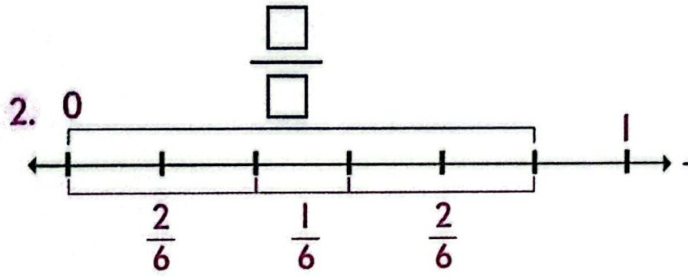
So, the final charge of Jad's tablet is $\frac{\square}{\square}$.

PRACTICE

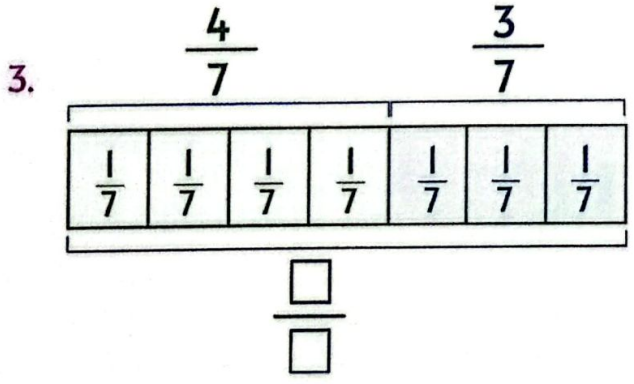
A. Find each sum.

1. 

$\frac{1}{4} + \frac{1}{4} = \frac{\square}{\square}$

2. 

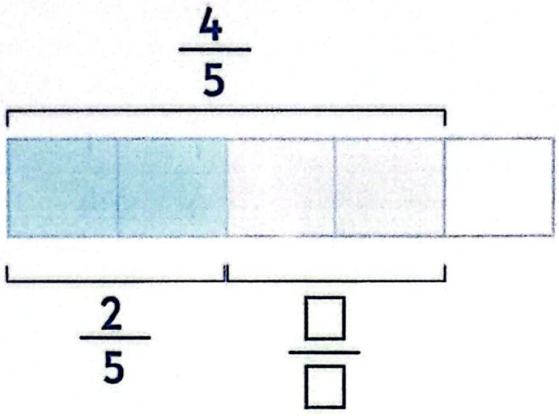
$\frac{2}{6} + \frac{1}{6} + \frac{2}{6} = \frac{\square}{\square}$

3. 

$\frac{4}{7} + \frac{3}{7} = \frac{\square}{\square} = \square$

4 sevenths + 3 sevenths = 7 sevenths = 1 whole

B. Find the difference between $\frac{4}{5}$ and $\frac{2}{5}$.

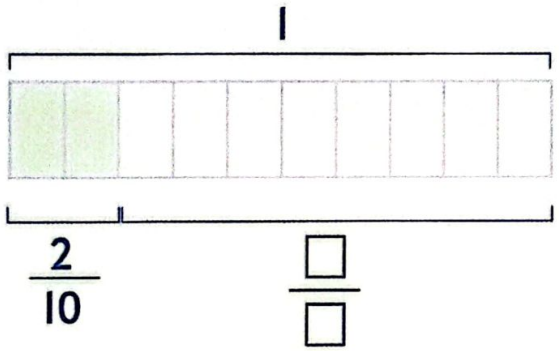


$$\frac{4}{5} - \frac{2}{5} = \frac{\square}{\square}$$

C. Subtract $\frac{2}{10}$ from 1.

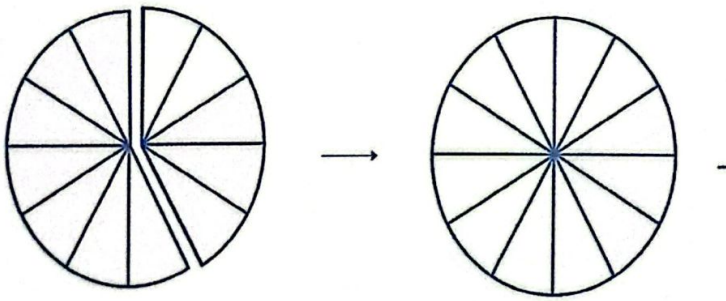
$1 = \frac{10}{10}$





$$1 - \frac{2}{10} = \frac{\square}{\square}$$

D. Subtract $\frac{7}{12}$ from $\frac{10}{12}$.



$$\frac{10}{12} - \frac{7}{12} = \frac{\square}{\square}$$

E. Which pair of fractions adds up to 1?
Choose the correct answer.

(a) $\frac{7}{10}$ and $\frac{2}{10}$ (b) $\frac{5}{12}$ and $\frac{7}{12}$ (c) $\frac{7}{9}$ and $\frac{1}{9}$

F. Write an equation with three fractions of the same denominator 11 whose sum is 1.

$\frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} = 1$

G. Match.

$\frac{4}{7} + \frac{2}{7}$	$\frac{10}{11} - \frac{5}{11}$
one sixth + two sixths	$1 - \frac{1}{7}$
$\frac{2}{11} + \frac{3}{11}$	five eighths - one eighth

H. Find the unknown fraction.

1. $\frac{\square}{\square} - \frac{2}{9} = \frac{5}{9}$ 2. $\frac{3}{5} + \frac{\square}{\square} = 1$ 3. $1 - \frac{\square}{\square} = \frac{7}{13}$

I. Word Problems

1. Adam painted $\frac{2}{9}$ of the fence in the morning and $\frac{4}{9}$ in the afternoon.
   What fraction of the fence did he paint in total?

   _____

   _____

2. A water tank is $\frac{9}{10}$ full. The gardener uses $\frac{2}{10}$ of the water to water his plants.
   What fraction of the water is left in the tank?

   _____

   _____

3. Lyn baked a pie. She ate $\frac{1}{6}$ of the pie and gave $\frac{3}{6}$ of it to her friends.
   What fraction of the pie does she have left?

   _____

   _____

   _____

LESSON 14 IMPROPER FRACTIONS AND MIXED NUMBERS

OBJECTIVES

- Recognize improper fractions and mixed numbers.
- Write a mixed number as an improper fraction.
- Write an improper fraction as a mixed number.
- Add and subtract mixed numbers with like denominators.

THINK

Lyn's mother uses two and a half identical ice cube trays to prepare lemonade juice for her guests. What fraction of the ice cube trays does she use?



LEARN

Use fraction strips to model the fraction that represents the number of the ice cube trays used.

1	1	1
1	1	$\frac{1}{2}$
$\frac{1}{2}$ $\frac{1}{2}$	$\frac{1}{2}$ $\frac{1}{2}$	$\frac{1}{2}$

- $1 + 1 + \frac{1}{2} = \frac{2}{2} + \frac{2}{2} + \frac{1}{2} = \frac{2+2+1}{2} = \frac{5}{2}$

An improper fraction is a fraction where the numerator is greater than or equal to the denominator. It is a fraction greater than or equal to 1.

5 halves > 1



$\frac{5}{2}$ is an improper fraction since 5 > 2.

She uses $\frac{\square}{\square}$ of the ice cube trays.

- $1 + 1 + \frac{1}{2} = 2 + \frac{1}{2} = 2\frac{1}{2}$

A mixed number is a number represented by a whole number and a fraction less than 1.

$2\frac{1}{2}$ is a mixed number.

2: Whole number

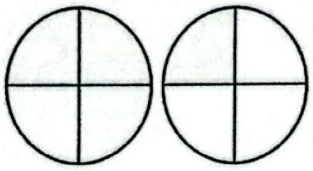
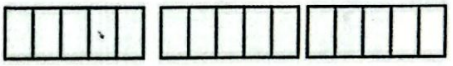
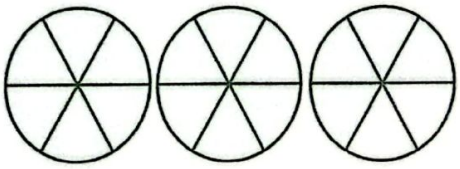
$\frac{1}{2}$: Fraction < 1

Read: two and one half

LESSON 14

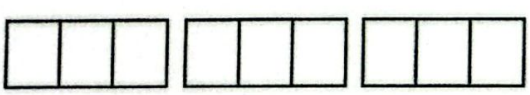
PRACTICE

A. Write the mixed number and the improper fraction represented by each model.

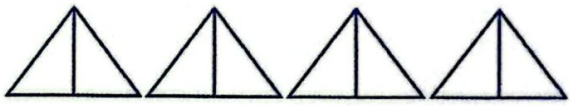
	Model	Mixed number	Improper fraction
1.		$1\frac{1}{4}$	$\frac{5}{4}$
2.		$\frac{\square}{\square}$	$\frac{\square}{\square}$
3.		$\frac{\square}{\square}$	$\frac{\square}{\square}$

B. Shade the model to represent each given mixed number.

1. $2\frac{1}{3}$

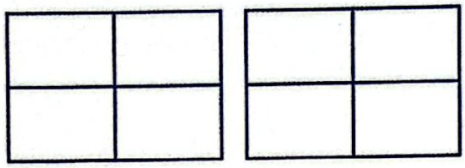


2. $3\frac{1}{2}$

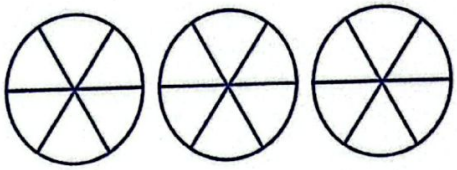


C. Shade the model to represent each given improper fraction.

1. $\frac{7}{4}$



2. $\frac{17}{6}$



D. Write the mixed number as an improper fraction.

1. $1\frac{4}{5} = 1 + \frac{4}{5} = \frac{5}{5} + \frac{4}{5} = \frac{5+4}{5} = \frac{9}{5}$ $\quad 1 = \frac{5}{5}$

2. $1\frac{7}{9} =$ _____

3. $2\frac{1}{3} =$ _____

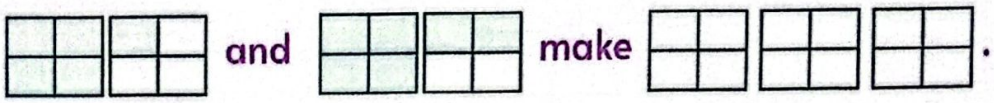
E. Write the improper fraction as a mixed number.

1. $\frac{10}{9} = \frac{9+1}{9} = \frac{9}{9} + \frac{1}{9} = 1 + \frac{1}{9} = 1\frac{1}{9}$

2. $\frac{7}{4} =$ _____

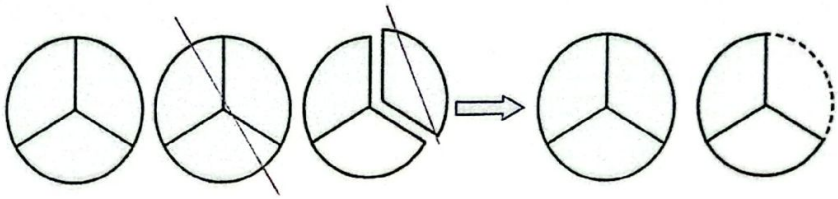
3. $\frac{8}{3} =$ _____

F. Write the mixed number of each model. Shade the model that represents the sum of the mixed numbers. Then write the sum as a mixed number.



$$__\frac{\square}{\square} + __\frac{\square}{\square} = __\frac{\square}{\square}$$

G. 1. Use the model to subtract $1\frac{1}{3}$ from $2\frac{2}{3}$.



$$2\frac{2}{3} - 1\frac{1}{3} = __\frac{\square}{\square}$$

2. Write the mixed numbers as improper fractions. Then subtract.

$2\frac{2}{3} =$ _____

$1\frac{1}{3} =$ _____

$2\frac{2}{3} - 1\frac{1}{3} =$ _____

H. Find the sum or the difference.

1. $3\frac{1}{5} + 4\frac{2}{5} = 7\frac{3}{5}$

2. $12\frac{2}{16} + 5\frac{13}{16}$

3. $9\frac{4}{7} - 2\frac{1}{7}$

I. Word Problems

1. A clinic opens for $2\frac{7}{10}$ hours in the morning and $3\frac{2}{10}$ hours in the afternoon. How long is the clinic open each day?

Operation

_____

_____

2. A baker ordered a bag of sugar weighing $19\frac{7}{8}$ kilograms. He used $10\frac{1}{8}$ kilograms in the first week and $7\frac{3}{8}$ kilograms in the second week. How many kilograms of sugar were left at the end of the two weeks?

Operations

_____

_____

_____

LESSON 15 MULTIPLY A FRACTION BY A WHOLE NUMBER

OBJECTIVES

- Write a non-unit fraction as a sum of unit fractions.
- Write a non-unit fraction as a multiple of a unit fraction.
- Multiply a fraction by a whole number.

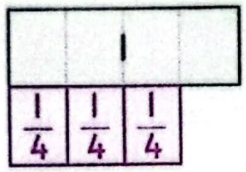
THINK

Jana and Adam are making smoothies.
Each smoothie needs $\frac{1}{4}$ cup of milk.

How much milk does Jana need for 3 smoothies?
How much milk does Adam need for 6 smoothies?

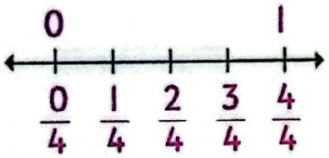


LEARN



$\frac{1}{4}$ is a unit fraction.

It represents one of the 4 equal parts of the whole.



$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$ (3 fourths)

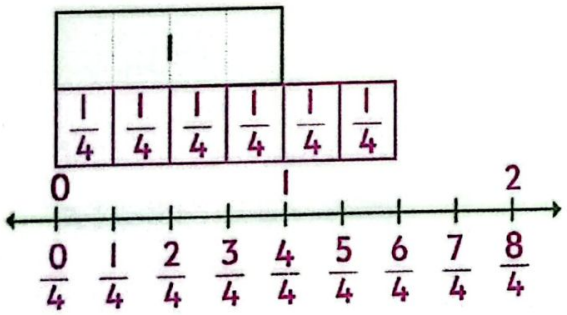
Repeated addition can be represented as multiplication.

$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = 3 \times \frac{1}{4} \longrightarrow \frac{3}{4} = 3 \times \frac{1}{4}$

Then $\frac{3}{4}$ is a multiple of $\frac{1}{4}$.

So, Jana needs $\frac{\square}{\square}$ cup of milk.

- Six $\frac{1}{4}$ cups of milk added together equal $\frac{6}{4}$ (6 fourths).



$6 \times \frac{1}{4} = \frac{6 \times 1}{4} = \frac{6}{4} = \frac{4}{4} + \frac{2}{4} = 1\frac{2}{4}$

Then Adam needs $\frac{\square}{\square}$ cups of milk or — $\frac{\square}{\square}$ cups of milk.

PRACTICE

A. Use the model to write each of the following fractions as a sum of unit fractions and then as a multiple of a unit fraction.

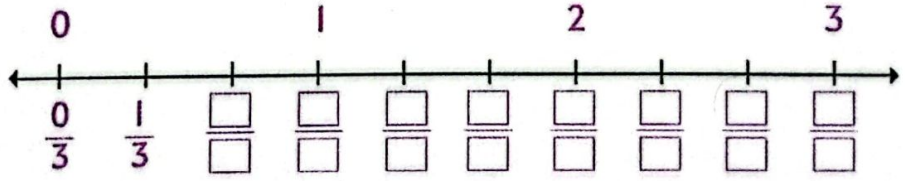
1. $\frac{4}{5} = \frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} = ___ \times \frac{1}{5}$

$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$

2. $\frac{6}{10} = \frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} = ___ \times \frac{\square}{\square}$

$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$

B. Use the number line to write the next 8 multiples of the fraction $\frac{1}{3}$.



C. Use the model to multiply.

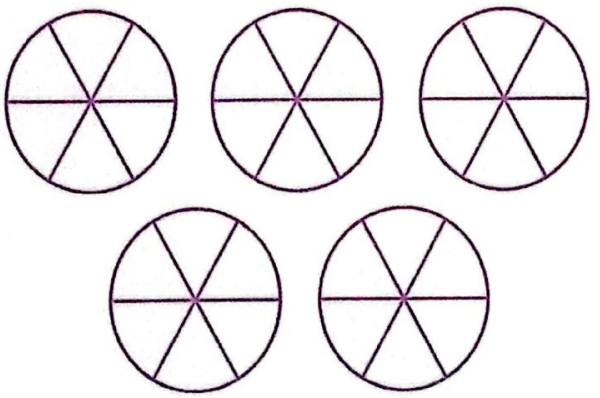
1.

$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$
$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$
$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$

$3 \times \frac{2}{5} = \frac{2}{5} + \frac{2}{5} + \frac{2}{5} = \frac{\square}{\square}$

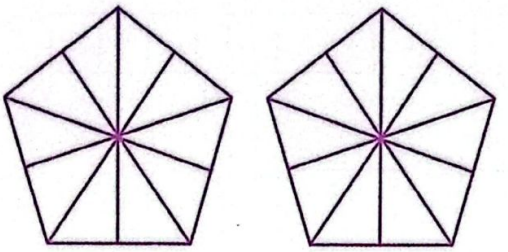
So, $3 \times \frac{2}{5} = \frac{\square \times \square}{5} = \frac{\square}{\square}$.

2.



$5 \times \frac{5}{6} = \frac{\square \times \square}{6} = \frac{\square}{\square}$

D. The model shows the product $2 \times \frac{3}{10}$.



1. How many $\frac{1}{10}$ parts are shaded? _____

2. Complete. $2 \times \frac{3}{10} =$ _____ $\times \frac{1}{10}$

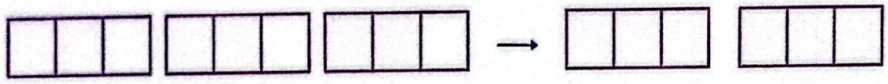
3. Find the product. $2 \times \frac{3}{10} = \frac{\square}{\square}$

E. Multiply and write the answer as a mixed number.

1. $2 \times \frac{3}{4} = \frac{2 \times 3}{4} = \frac{6}{4} = \frac{4+2}{4} = \frac{4}{4} + \frac{2}{4} = 1\frac{2}{4}$

2. $5 \times \frac{4}{9} =$ _____

F. 1. Use the model to find the product $3 \times \frac{2}{3}$.



$$3 \times \frac{2}{3} = ____$$

2. Calculate.

$9 \times \frac{5}{9} = ____$

The product of a fraction and its denominator is equal to the numerator.

G. Word Problems

1. Adam ran $\frac{3}{4}$ of a mile each day for 8 days.

How many miles did he run in all?

2. There are 16 people at a pizza party.

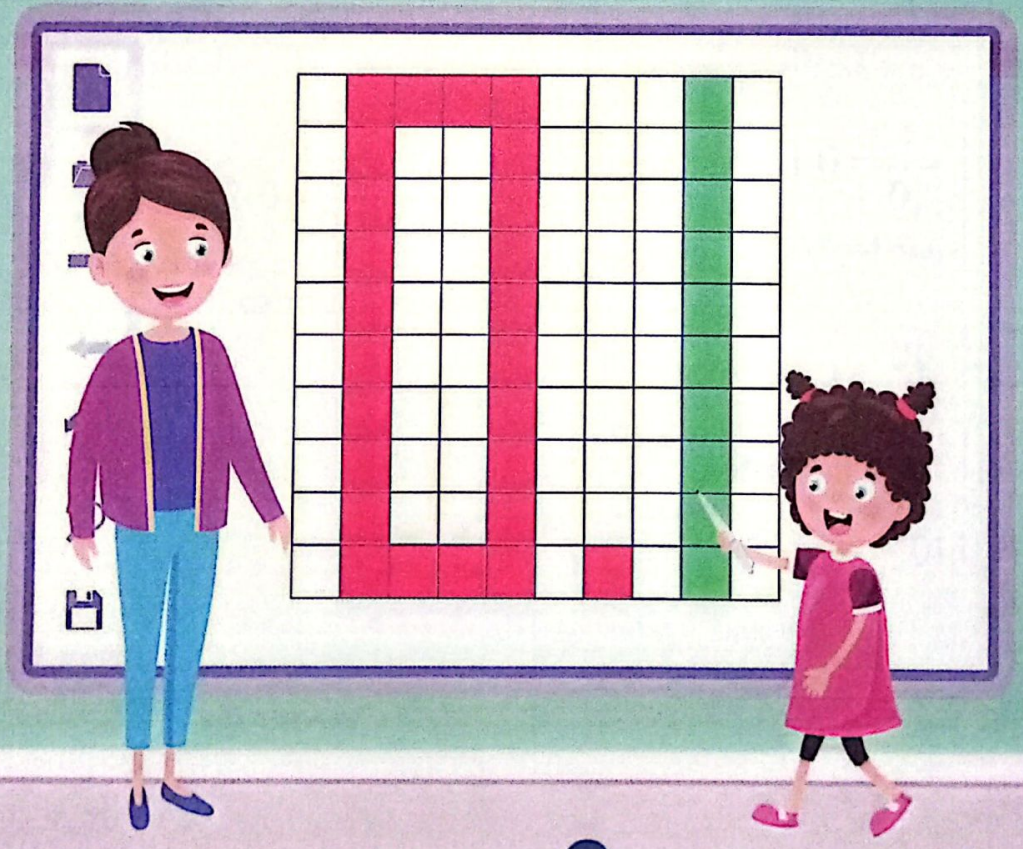
If each person eats $\frac{9}{16}$ of a pizza, how many pizzas will be needed for everyone at the party?

OBJECTIVES

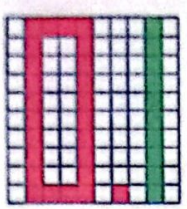
- Recognize decimal fractions and decimal numbers.
- Write fractions and mixed numbers with denominators of 10 and 100 in decimal form.
- Add two unlike fractions with denominators of 10 and 100.

THINK

Jana placed red and green square tiles on the hundreds grid to complete the activity assigned by her teacher.
What fraction does each colored part represent?



LEARN



$\frac{\square}{\square}$ represents the red part.

$\frac{\square}{\square}$ or $\frac{\square}{\square}$ represents the green part.

$\frac{25}{100}$ and $\frac{1}{10}$ are called decimal fractions.

A fraction with a denominator of 10 or 100 is a decimal fraction.

A decimal fraction can be written as a decimal number.

A decimal number is a number with a decimal point to separate the whole part on the left from the fractional part on the right.

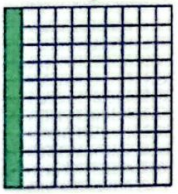
10 equal parts

one part → one tenth = $\frac{1}{10}$



$\frac{1}{10} = 0.1$

one tenth



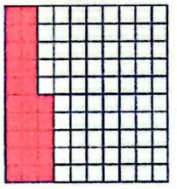
$\frac{10}{100} = 0.10$

ten hundredths

So, 0.1 = 0.10.

100 equal parts

one part → one hundredth = $\frac{1}{100}$

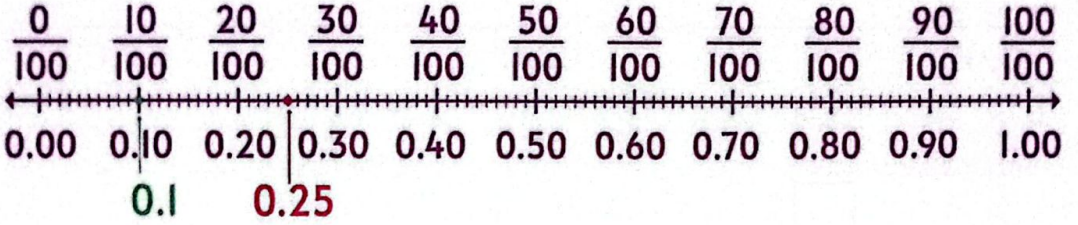


$\frac{25}{100} = 0.25$

twenty-five hundredths

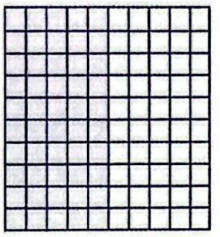
Ones	.	Tenths	Hundredths
0	.	2	5
0	.	1	0

Locate the decimals 0.25 and 0.1 on the number line.



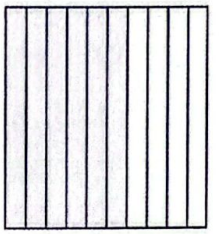
PRACTICE

A. Write the fraction and the decimal shown by the model.

1. 

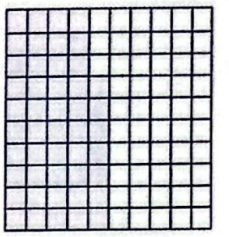
Fraction: $\frac{\square}{\square}$

Decimal: _____

2. 

Fraction: $\frac{\square}{\square}$

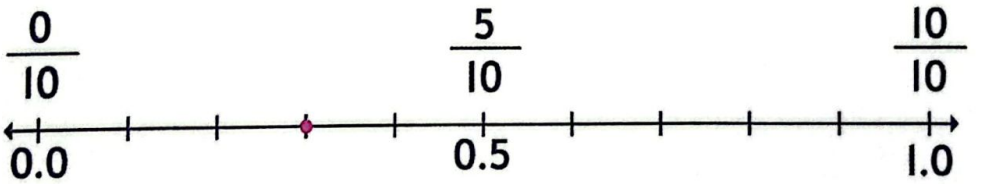
Decimal: _____

3. 

Fraction: $\frac{\square}{\square}$

Decimal: _____

B. Write the fraction and the decimal shown by the red dot on the number line.

1. 

Fraction: $\frac{\square}{\square}$

Decimal: _____

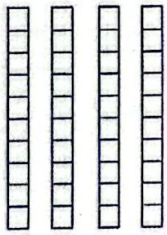
2. $\frac{0}{100}$ $\frac{50}{100}$ $\frac{100}{100}$



Fraction: $\frac{\square}{\square}$ Decimal: ———

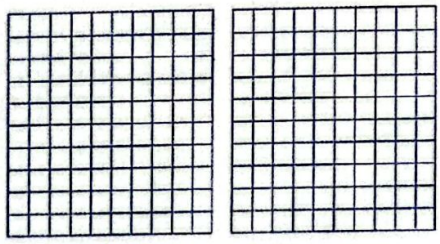
C. Shade the model to show the given mixed number. Then fill in the place value chart.

1. $3\frac{4}{10}$: 3 and 4 tenths



Ones	.	Tenths	Hundredths

2. $1\frac{16}{100}$: 1 and 16 hundredths



Ones	.	Tenths	Hundredths

D. Write in decimal form and in word form.

Decimal Form	Word Form
0.7	
	nine hundredths
	two and five tenths
3.26	
0.92	

E. Guess the number.
I am less than ten. I have 42 hundredths. My ones digit is double my tenths digit. Who am I?

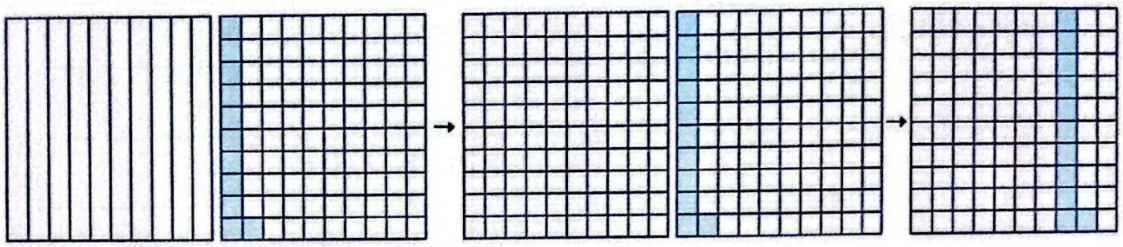
I am _____.

F. Write each decimal in fraction form. Add. Then write the sum in decimal form.

1. 0.4 + 0.3 = _____

2. 0.05 + 0.23 = _____

G. 1. Use the model to add $\frac{7}{10}$ and $\frac{11}{100}$.



$$\frac{7}{10} + \frac{11}{100} = \frac{\square}{100} + \frac{\square}{100} = \frac{\square}{\square}$$

2. Add.

$$\frac{7}{10} + \frac{23}{100} = \underline{\qquad\qquad}$$

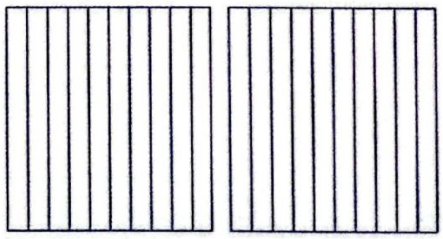
H. Word Problem

To make a fruit salad, Jana's mother buys 0.5 kg of mangoes, 0.2 kg of strawberries, 0.4 kg of kiwis, and 0.6 kg of bananas. How many kilograms of fruit does Jana's mother buy in total? Shade the model to find the answer.

_____

_____

_____



LESSON 17 COMPARE AND ORDER DECIMALS

OBJECTIVE

- Compare and order decimals up to the hundredths.

THINK

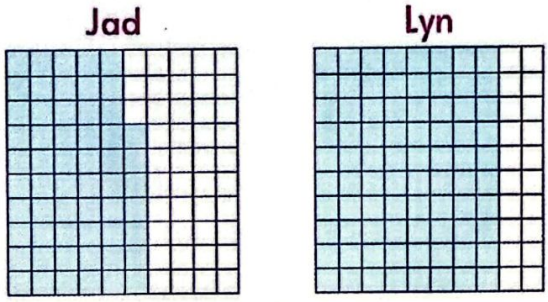
Jad and Lyn attend the same school in the neighborhood.
Jad's house is 0.57 kilometers away from the school.
Lyn's house is 0.8 kilometers away from the school.
Whose house is closer to the school?



LEARN

Compare the decimals 0.57 and 0.8.

First way: **Use a model.**



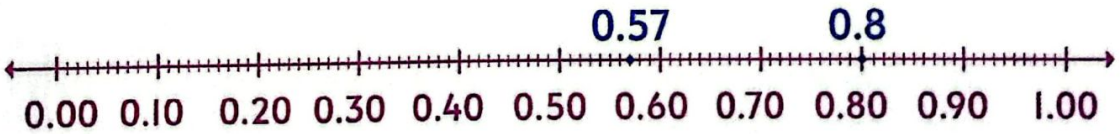
Second way: **Use place value.**

	Ones	.	Tenths	Hundredths
Jad	0	.	5	7
Lyn	0	.	8	0

The digits in the ones place are the same.
Compare the digits in the tenths place.

5 tenths < 8 tenths, so 0.57 < 0.8.

Third way: **Use a number line.**

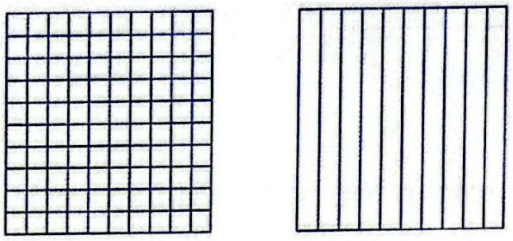


0.57 is closer to 0 than 0.8 is to 0.
So, 0.57 < 0.8.
Therefore, _____ house is closer to the school.

PRACTICE

A. Shade to model each decimal. Then compare the decimals using <, >, or =.

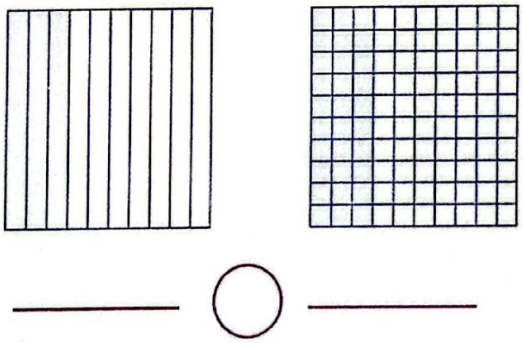
0.53 0.6



0.53 ◯ 0.6

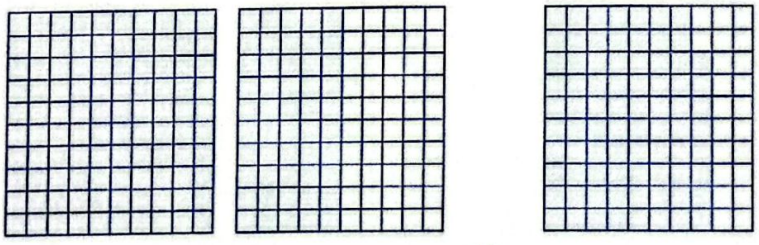
B. Use the model to write each decimal. Then compare the decimals using <, >, or =.

1.



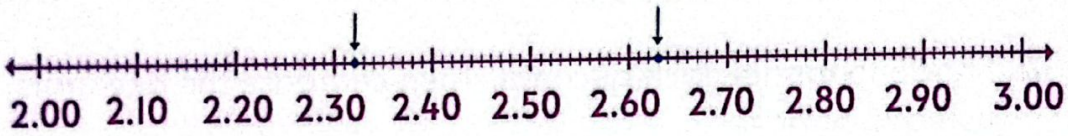
_____ ◯ _____

2.



_____ ◯ _____

3.



_____ ◯ _____

C. Write the decimals in the place value chart. Then compare the decimals using <, >, or =.

1.

Decimal	Ones	.	Tenths	Hundredths
7.43				
9.3				

7.43 ◯ 9.3

2.

Decimal	Ones	.	Tenths	Hundredths
0.7				
0.59				

0.7 ◯ 0.59

D. Compare the decimals. Write <, >, or =.

1. 0.15 ◯ 0.09

2. 3.7 ◯ 3.70

3. 3.88 ◯ 4.2

4. 1.03 ◯ 1.3

E. Locate the decimals on the number line. Then write the decimals from least to greatest.

3.15 ; 3.5 ; 4.0 ; 3.05 ; 3.55



_____ < _____ < _____ < _____ < _____

F. Write a decimal that comes before, after, or between.

1. _____ < 3.42 < _____

2. _____ < 7 < _____

3. 1.2 < _____ < 1.9

4. 0.5 < _____ < 0.6

G. Lyn said that 60 > 6, then 1.60 > 1.6. Is she right? Explain.

_____

_____

H. Word Problem

The table shows the time each student took to finish the art project. All the students started at the same time.

a. Which student finished the project first?

_____

Student	Time (in hours)
Lyn	1.2
Karim	1.05
Jad	0.94
Jana	1.36

b. Which student took the longest time to finish the project?

_____

c. Which student took between 1 hour and 1.15 hours to finish the project?

_____

d. Arrange the times from greatest to least.

_____ > _____ > _____ > _____

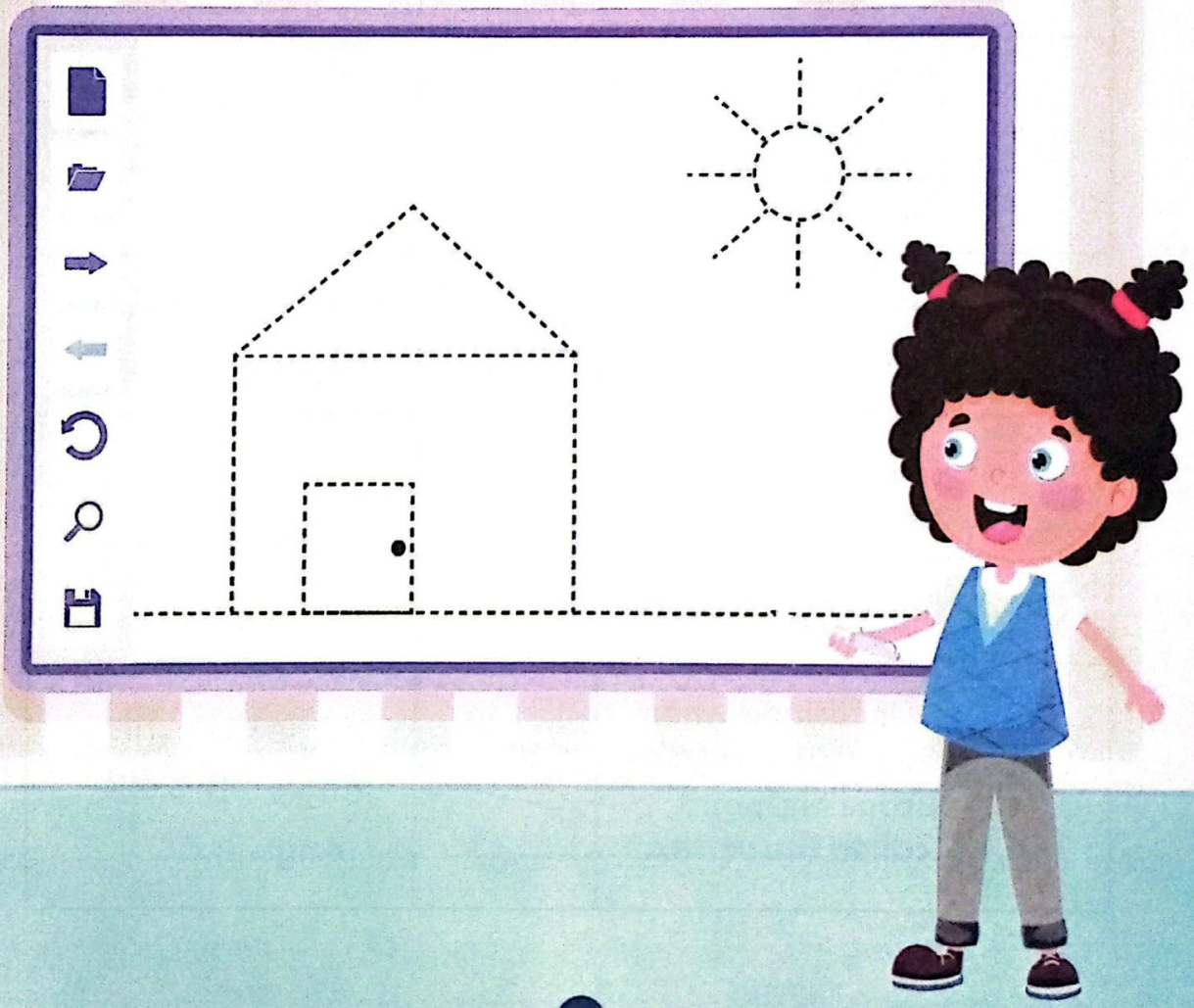
LESSON 18 POINTS, LINES, LINE SEGMENTS, RAYS, AND ANGLES

OBJECTIVES

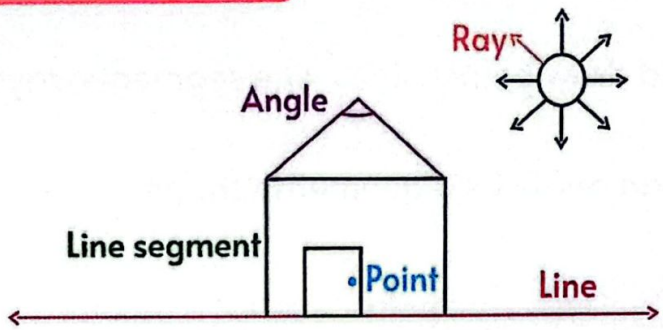
- Identify and draw points, lines, line segments, rays, and angles.
- Recognize an angle as a geometric shape.

THINK

In art class, Jana wants to connect the dots of each object in the following picture.



LEARN



Term	Definition	Drawing	Symbol
Point	It is an exact location.	dot A	Point A
Line	It is a straight path of points that never ends in both directions.	B C	Line BC: $\overleftrightarrow{BC}$ Line CB: $\overleftrightarrow{CB}$
Line segment	It is a part of a line with two endpoints.	endpoints D E	Line segment ED: $\overline{ED}$ Line segment DE: $\overline{DE}$
Ray	It is a part of a line with one endpoint and never ends in the other direction.	F G	Ray FG: $\overrightarrow{FG}$
Angle	It is formed when two rays share the same endpoint, called the vertex.	H J I vertex	Angle HIJ: $\angle HIJ$ Angle JIH: $\angle JIH$ Angle I: $\angle I$

PRACTICE

A. Write point, line, line segment, ray, or angle for each drawing.

1. Flashlight



_____

2. Pencil tip

_____

3. Pizza slice



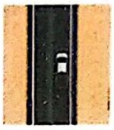
_____

4. Ruler edge



_____

5. Freeway



_____

6. Laser pen



_____

B. Identify each figure and name it in two ways.

1. 

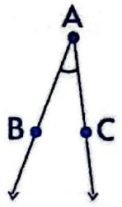
Line

$\overleftrightarrow{EF}$, _____

2. 

_____

_____, _____

3. 

_____

_____, _____

C. Cross out the figures that are not line segments.

1. 

2. 

3. 

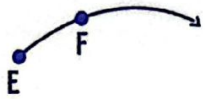
4. 

D. Indicate whether the figure is a ray or not. Circle Yes or No. Then name the ray.

1. 

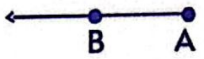
Yes No

_____

2. 

Yes No

_____

3. 

Yes No

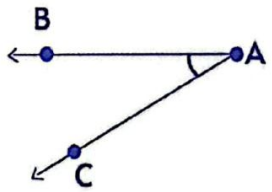
_____

E. Adam drew the angle below and named it ∠ABC.

1. Explain why Adam's naming of the angle is incorrect.

_____

_____



2. Write three names for the angle.

_____, _____, _____

F. Draw and label each of the following.

1. $\overrightarrow{MN}$

2. $\overleftrightarrow{YZ}$

3. $\overline{PQ}$

4. $\angle ABC$

G. Use the given three points Q, R, and S to complete the table below.

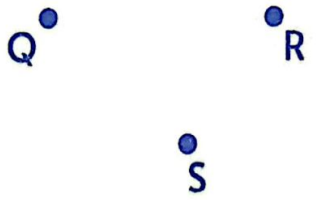


Figure	Number of Figures	Name
Line	3	$\overleftrightarrow{QS}$, _____, _____
Line segment		
Ray		
Angle		

H. 1. Locate two points M and N.

2. Draw the ray $\overrightarrow{MN}$.

3. Draw and name another ray $\overrightarrow{MP}$ with endpoint M.

4. Name the angle formed by the two rays. _____

I. Word Problem

Last night, Jad was watching the constellations of stars using his telescope.

Use the picture to name the following.

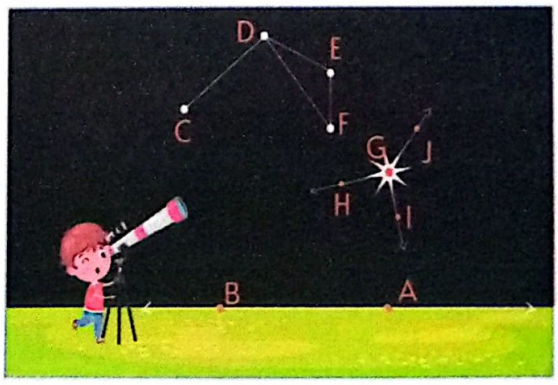
3 points: ____, ____, ____

1 line: ____

2 line segments: ____, ____

2 rays: ____, ____

2 angles: ____, ____



LESSON 19 MEASURE AND DRAW ANGLES

OBJECTIVES

- Recognize angles and fractional parts of a circle.
- Measure and draw angles using a protractor.
- Recognize different types of angles.
- Find unknown angle measures on a diagram.

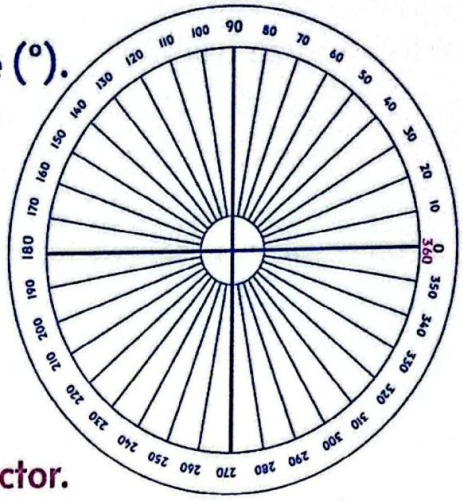
THINK

On a hot summer day, Lyn and Jana used their paper fans while playing in the garden.
Who opened her paper fan wider?



LEARN

A unit of measure of angles is degree (°).



- Angles are measured with reference to a circle.

A circle (full turn) is 360°.

The one degree is $\frac{1}{360}$ of a circle.

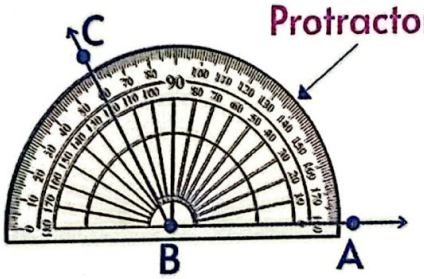
- Angles are measured using a protractor.

Place the center of the protractor at the vertex of the angle.

Align 0 at one side.

Read the number on the other side.

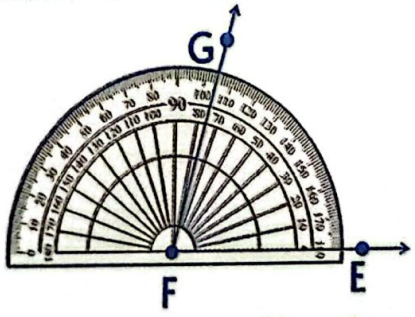
Lyn's fan is represented by the angle ABC.



The measure of ∠ABC is 120°.

m∠ABC = 120°

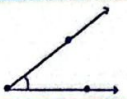
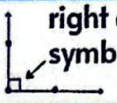
Jana's fan is represented by the angle EFG.



The measure of ∠EFG is 75°.

m∠EFG = 75°

So, _____ opened her fan wider.

Type of Angle	Acute	Right	Obtuse	Straight
Figure				
Measure	between 0° and 90°	90°	between 90° and 180°	180°

PRACTICE

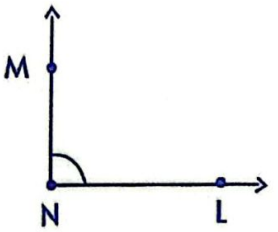
A. Match each clock with the type of angle its hands show.



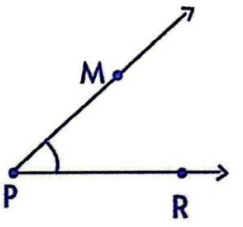



Acute Right Obtuse Straight

B. Measure each angle. Then write whether it is right, acute, obtuse, or straight.

1. 

m∠MNL = _____
Type: _____

2. 

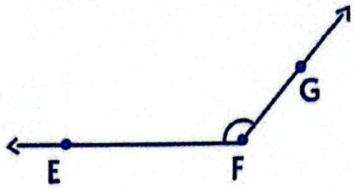
m∠MPR = _____
Type: _____

3.



m∠ABC = _____
Type: _____

4.



m∠EFG = _____
Type: _____

C. Use a protractor to draw and label the following angles.

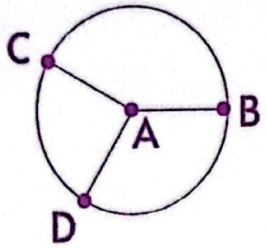
1. m∠ABC = 90°

2. m∠LMN = 135°

3. m∠EFG = 50°

4. m∠PQR = 180°

D. 1. Find the measure of each angle in the circle using a protractor.



$m\angle BAC = \underline{150°}$

$m\angle CAD = _____$

$m\angle DAB = _____$

2. Find the sum of the three angles' measures.

_____

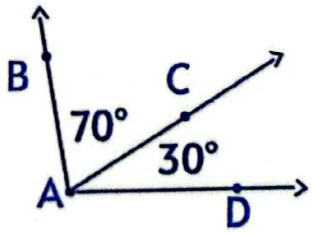
3. Write the missing fraction.

$\angle BAC$ turns through $\frac{150}{360}$ of the circle.

$\angle DAB$ turns through $\frac{\square}{\square}$ of the circle.

E. Find the value of the unknown angle measure.

1. $m\angle BAD = _____$

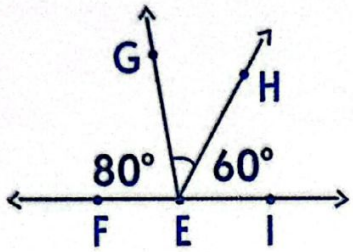


$m\angle BAD = m\angle BAC + m\angle CAD$

$m\angle BAD = _____ + _____$

$m\angle BAD = _____$

2. m∠GEH = _____



m∠FEG + m∠GEH + m∠HEI = _____

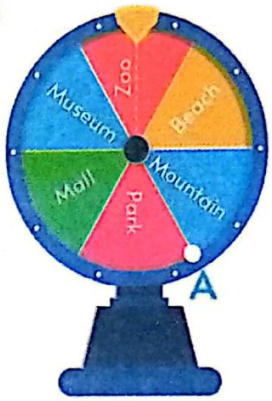
_____ + m∠GEH + _____ = _____

m∠GEH + _____ = _____

m∠GEH = _____

F. Word Problem

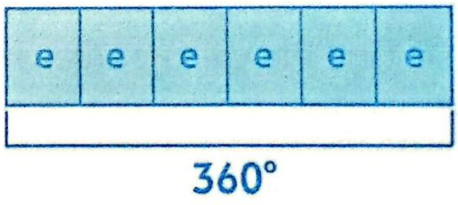
A fourth-grade teacher wants to take her students on a trip. To determine the destination, she spins the wheel of fortune, and the arrow stops precisely at the middle of the "Zoo" section.



a. Let e be the measure of one of the six equal angles of the wheel. Find the value of the unknown number e.

_____

_____



b. Find the measure of the obtuse angle that the arrow makes with the starting point A.

Measure = _____ + _____ + _____ = _____

LESSON 20 PARALLEL AND PERPENDICULAR LINES

OBJECTIVES

- Recognize intersecting, parallel, and perpendicular lines.
- Identify and draw parallel and perpendicular lines.

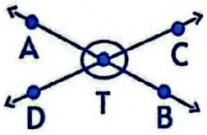
THINK

A farmer used a ladder to pick olives. The ladder is formed by 2 vertical rails and 7 horizontal rungs.
Which parts of the ladder never meet?
Which parts of the ladder meet at a right angle?



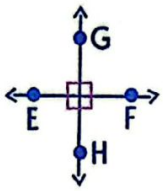
LEARN

- Intersecting lines are two lines that cross each other at one point. The point where they cross is called the point of intersection.



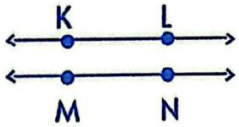
$\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect at point T.

- Two lines are perpendicular if they intersect to form four right angles.



Read: Line EF is perpendicular to line GH.
Write: $\overleftrightarrow{EF} \perp \overleftrightarrow{GH}$

- Two lines are parallel if they never intersect. Parallel lines keep the same distance between them.

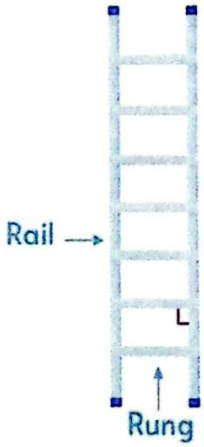


Read: Line KL is parallel to line MN.
Write: $\overleftrightarrow{KL} \parallel \overleftrightarrow{MN}$

So, the _____ will never meet.
They are parallel.

The _____ are parallel, too.

The _____ and the _____ meet at a right angle. They are perpendicular.



- Line segments and rays can also be parallel, perpendicular, or intersecting.

PRACTICE

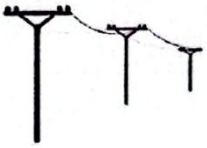
A. Write parallel, perpendicular, or intersecting for each drawing.

1. Pair of scissors



_____

2. Power poles



_____

3. Windmill



_____

B. Draw each figure and label it.

1. $\overleftrightarrow{KL} \parallel \overleftrightarrow{MN}$

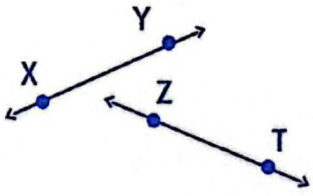
2. $\overline{EF} \perp \overline{FG}$

3. $\overleftrightarrow{HI}$ and $\overleftrightarrow{JK}$ intersect at point L.

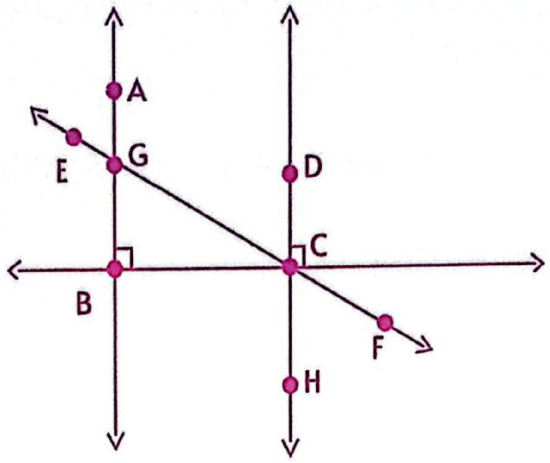
C. Adam says that the lines $\overleftrightarrow{XY}$ and $\overleftrightarrow{ZT}$ are not intersecting. Is Adam right? Justify.

_____

_____



D. Use the figure to answer the following questions.



1. Name a line segment parallel to the line segment $\overline{AB}$.

   _____

2. Name the line perpendicular to the line $\overleftrightarrow{AB}$.

   _____

3. Name a pair of rays that intersect at point C.

   _____, _____

4. Name the point of intersection of the lines $\overleftrightarrow{AB}$ and $\overleftrightarrow{EF}$.

   _____

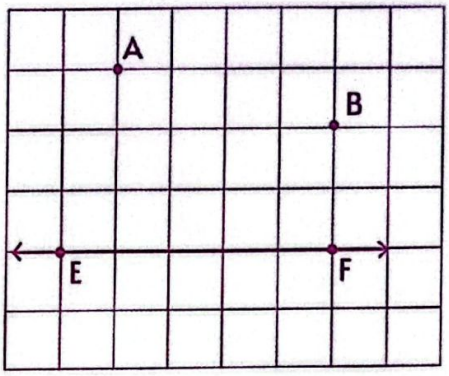
5. Name two intersecting line segments that are not perpendicular. _____, _____

6. Find the measure of the angle HCF. Then write whether the rays $\overrightarrow{CH}$ and $\overrightarrow{CF}$ are perpendicular or not.

   _____

E. 1. On the grid below, draw the line $\overleftrightarrow{AX}$ perpendicular to the line $\overleftrightarrow{EF}$. C is the point of intersection of $\overleftrightarrow{AX}$ and $\overleftrightarrow{EF}$.

2. Find the measure of the angle ACF.

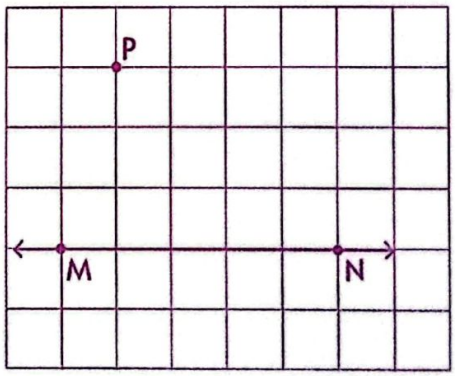


3. Describe the lines $\overleftrightarrow{BF}$ and $\overleftrightarrow{EF}$.

4. What can you say about the two lines $\overleftrightarrow{AX}$ and $\overleftrightarrow{BF}$?

F. 1. On the grid below, draw the line $\overleftrightarrow{PQ}$ parallel to the line $\overleftrightarrow{MN}$.

2. Draw the line $\overleftrightarrow{PR}$ perpendicular to the line $\overleftrightarrow{MN}$ at point R.



3. What do you notice about the rays $\overrightarrow{PQ}$ and $\overrightarrow{PR}$?

G. Word Problem

The teacher shows the students the W City map on the active board.



a. Name two streets that appear to be parallel to each other.

_____

b. Name two streets that intersect but do not appear to be perpendicular.

_____

c. Name a street that appears to be perpendicular to W 5th Street.

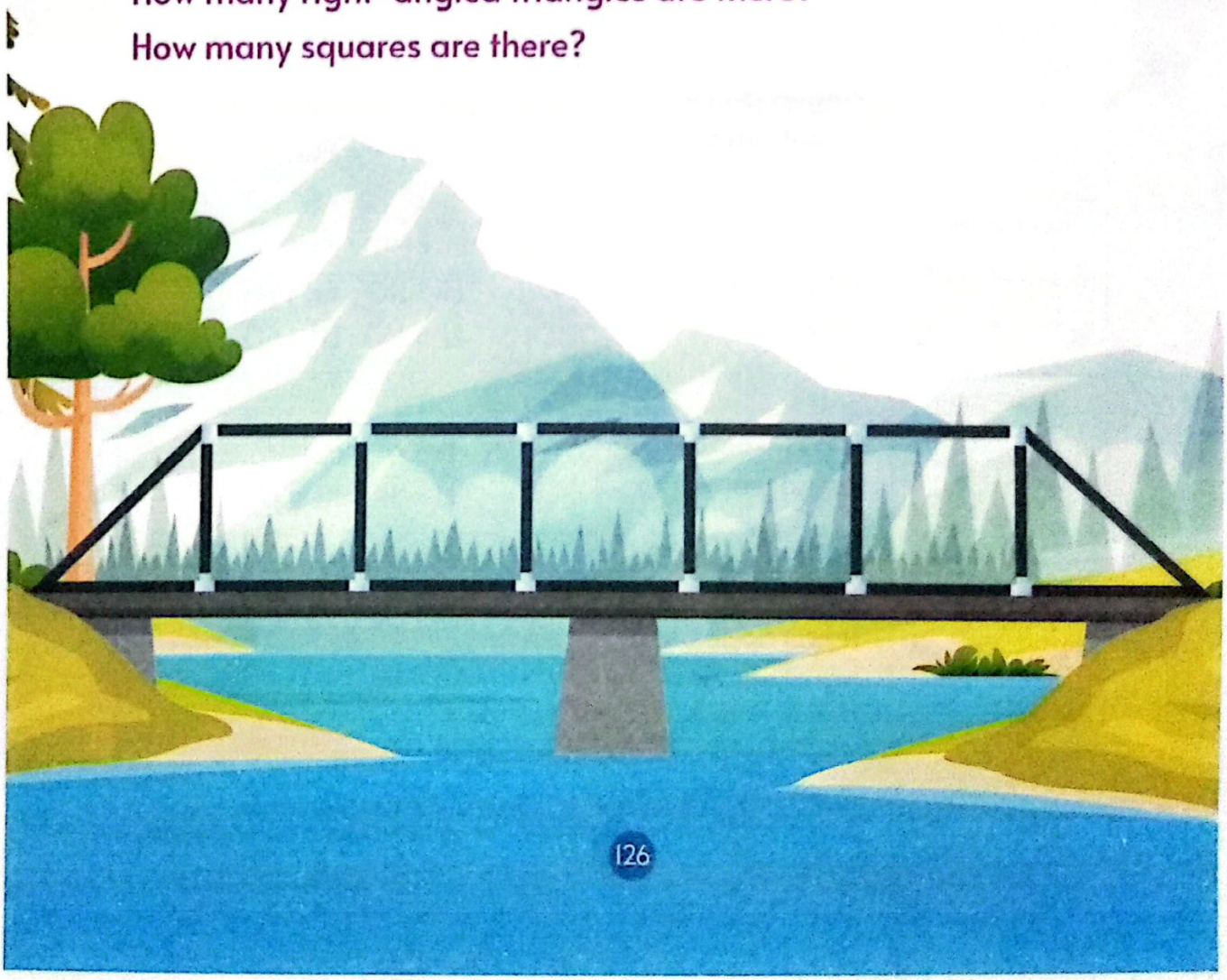
_____

OBJECTIVES

- Identify right triangles.
- Identify special quadrilaterals (square, rectangle, rhombus, and parallelogram).

THINK

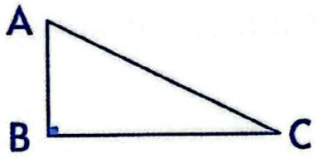
The horizontal and vertical pieces of the bridge in the picture are of equal length.
How many right-angled triangles are there?
How many squares are there?



LEARN

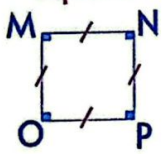
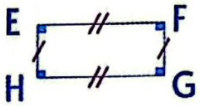
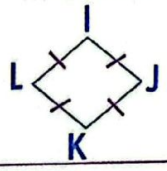
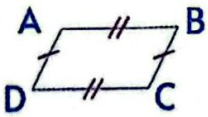
- A triangle is a polygon with 3 sides.

A right triangle is a triangle with a right angle.

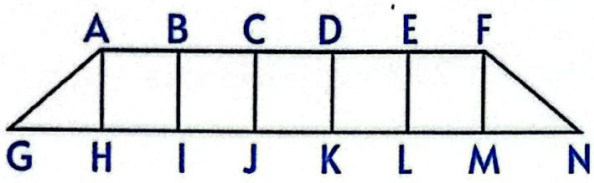


ABC is a right triangle since $m\angle ABC = 90°$.

- A quadrilateral is a polygon with 4 sides.
Square, rectangle, rhombus, and parallelogram are special quadrilaterals.

Figure	Definition	Properties
Square 	It has 4 right angles and 4 equal sides.	$m\angle M = m\angle N = m\angle P = m\angle O = 90°$ $\overline{MN} \parallel \overline{OP}$; $\overline{MO} \parallel \overline{NP}$ $\overline{MN} = \overline{NP} = \overline{PO} = \overline{OM}$
Rectangle 	It has 4 right angles.	$m\angle E = m\angle F = m\angle G = m\angle H = 90°$ $\overline{EF} \parallel \overline{HG}$; $\overline{EH} \parallel \overline{FG}$ $\overline{EF} = \overline{HG}$; $\overline{EH} = \overline{FG}$
Rhombus 	It has 4 sides of equal length.	$\overline{IL} \parallel \overline{JK}$; $\overline{LK} \parallel \overline{IJ}$ $\overline{IJ} = \overline{JK} = \overline{KL} = \overline{LI}$
Parallelogram 	It has opposite parallel sides.	$\overline{AB} \parallel \overline{DC}$; $\overline{AD} \parallel \overline{BC}$ $\overline{AB} = \overline{DC}$; $\overline{AD} = \overline{BC}$

The figure below represents the sketch of the bridge.



AHG is a _____.

CDKJ is a _____.

BELI is a _____.

There are ____ right triangles and ____ squares.

PRACTICE

A. Name the quadrilateral shown in each drawing below.

1. Book



_____

2. Wooden hanger



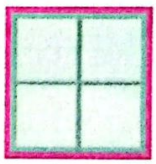
_____

3. Railing



_____

4. Window



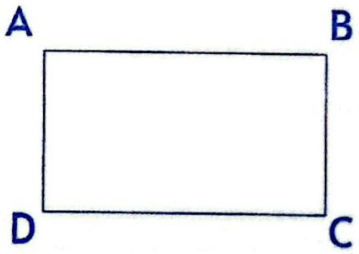
_____

B. ABCD is a rectangle.
Complete the following.

$\overline{AD} \parallel$ ____ ; $\overline{AB} \parallel$ ____

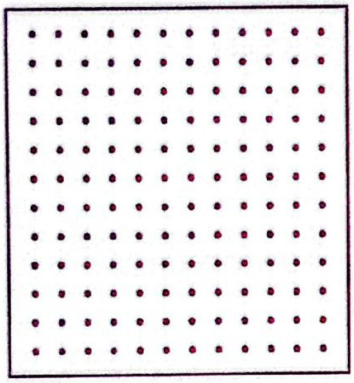
$\overline{AD} \perp$ ____ ; $\overline{AB} \perp$ ____

$\overline{AD} =$ ____ ; $\overline{AB} =$ ____

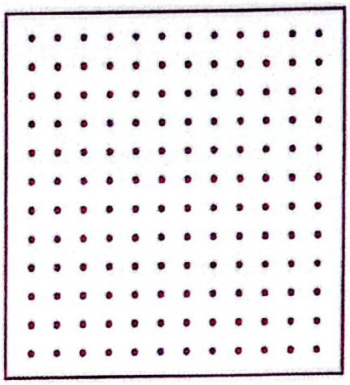


C. Draw the polygon on the grid below.

1. A quadrilateral with all sides of equal length and 4 right angles



2. A right triangle



D. Karim is playing with matchsticks of the same length.
Which quadrilaterals can he make using 4 matchsticks?

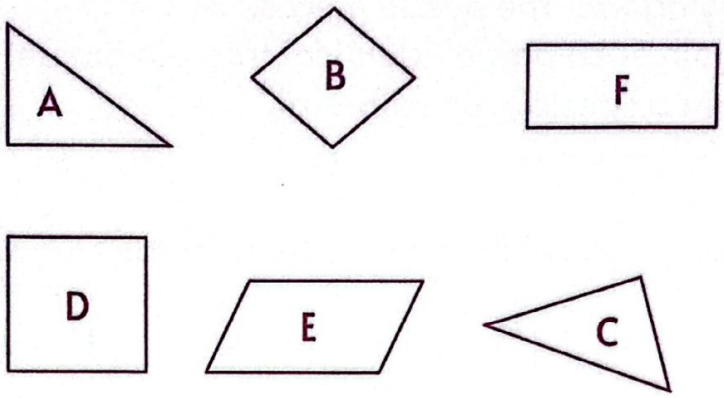
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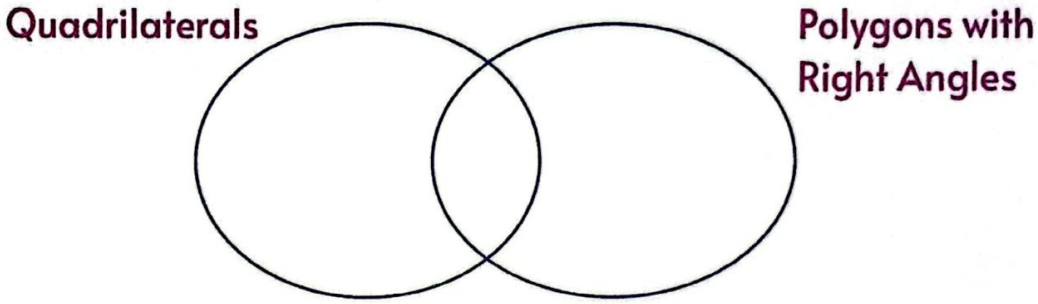
_____

E. Guess the shape.
I am a quadrilateral of 2 pairs of parallel sides but without any right angles.
Who am I?

I am a _____.

F. Write the letter of the shape where it belongs in the Venn diagram.





G. Circle True or False. Then justify.

1. Every square is a rectangle. True False

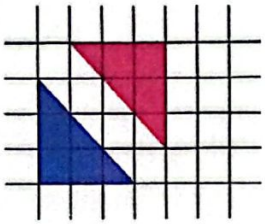
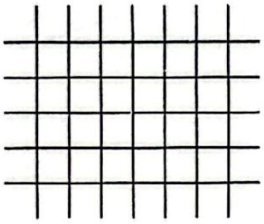
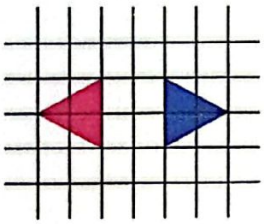
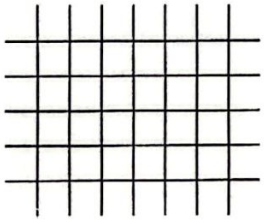
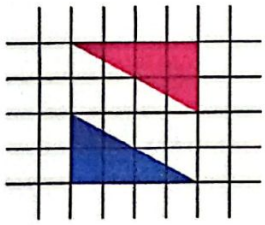
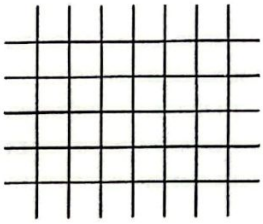
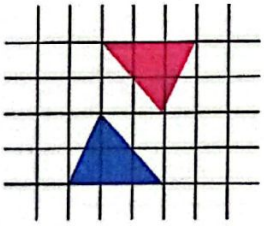
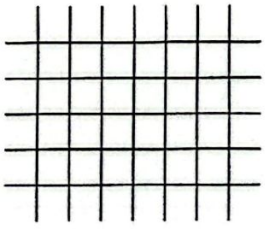
_____

2. Every parallelogram is a rhombus. True False

_____

H. Word problem

Adam is playing with the puzzle pieces.
Help Adam join each pair of identical triangle puzzle pieces to form a special quadrilateral.

Puzzle Pieces	Quadrilateral	Name of the Quadrilateral
		_____
		_____
		_____
		_____

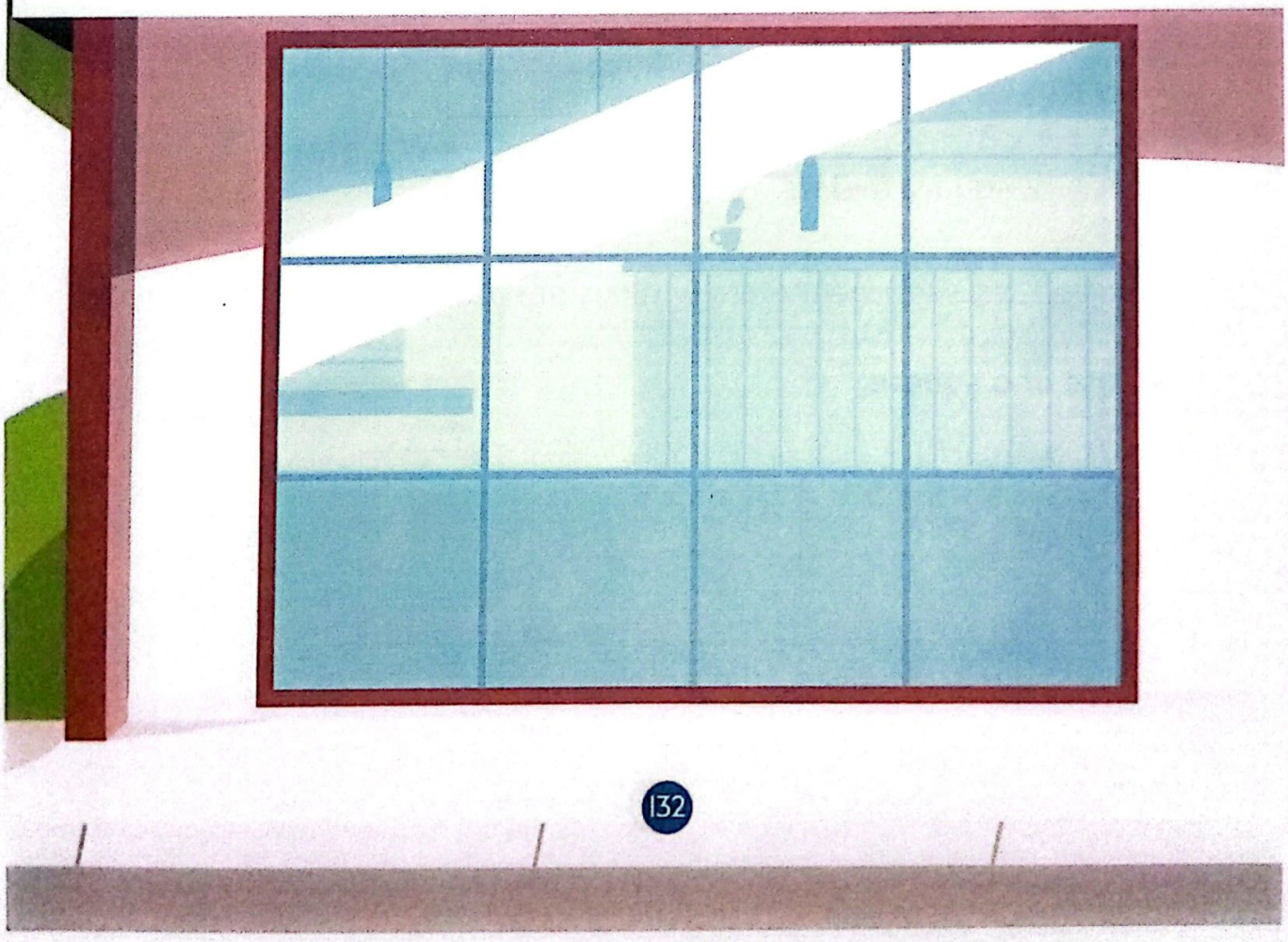
LESSON 22 PERIMETER AND AREA OF RECTANGLES AND SQUARES

OBJECTIVES

- Apply the perimeter and area formulas for rectangles and squares.
- Find the unknown side length of a rectangle and a square given their area or perimeter.

THINK

The front facade of a restaurant with a length of 4 meters and a width of 3 meters needs to be renovated.
How many meters of wooden frame are needed?
How many square meters of glass are required?

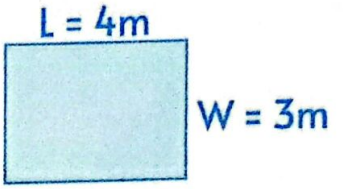


LEARN

- The perimeter P of the rectangular frame is the distance around it.

L: Length
W: Width

Use addition	Use multiplication
P = L + W + L + W	P = (L + W) + (L + W)
P = 4 + 3 + 4 + 3	P = 2 x (L + W)
P = 14 meters	P = 2 x (4 + 3)
	P = 2 x 7
	P = 14 meters

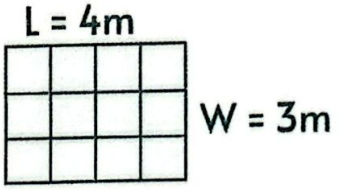


So, _____ meters of wooden frame are needed.

L and W are the dimensions of the rectangle.

- The area A of the rectangular facade is the number of unit squares needed to cover it.

A = L x W
A = 4 x 3
A = 12 square meters



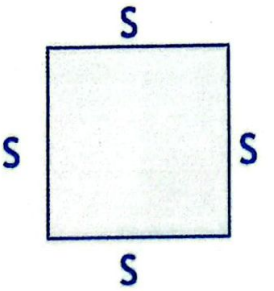
So, _____ square meters of glass are required.

- Case of a square:

S: Side

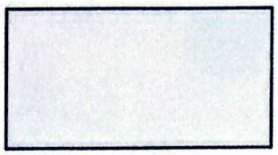
P = S + S + S + S
P = 4 x S

A = S x S



PRACTICE

A. Calculate the perimeter P and the area A of the rectangle.



P = 2 x (L + W)

P = 2 x (_____ + _____)

P = 2 x _____

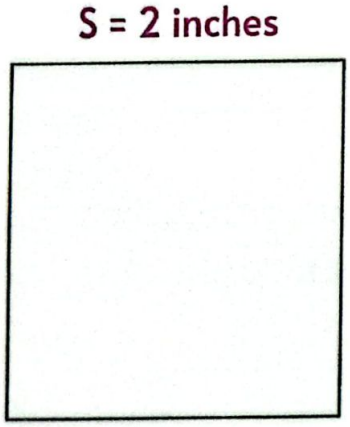
P = _____ centimeters

A = L x W

A = _____ x _____

A = _____ square centimeters

B. Calculate the perimeter P and the area A of the square.



P = 4 x S

P = _____ x _____

P = _____ inches

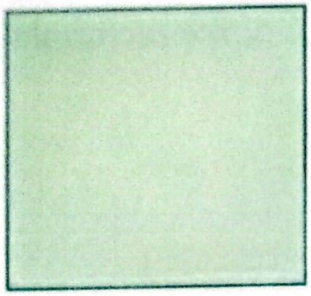
A = S x S

A = _____ x _____

A = _____ square inches

C. Find the width of each rectangle.

1. A = 42 square meters



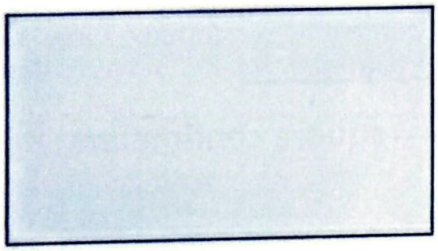
A = L x W

____ = ____ x W

W = ____ ÷ ____

W = ____ meters

2. P = 30 meters



P = 2 x (L + W)

____ = 2 x (____ + W)

____ ÷ 2 = ____ + W

____ = ____ + W

____ - ____ = W

W = ____ meters

D. The area of a rectangular pool is 30 square meters.

1. Give 2 possible dimensions of the pool.

_____

2. Jad said that if 2 rectangles have the same area, then they have the same perimeter. Is he right? Justify.

_____

_____

_____

E. The square floor in Lyn's bedroom has an area of 25 square inches.

1. Find the side length of the floor.

2. Calculate the perimeter of the floor.

F. Word Problems

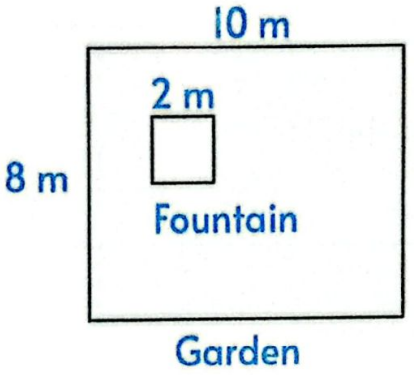
1. Jad wants to paint a wall with a length of 10 meters and a width of 3 meters. He needs to buy paint gallons. Each gallon can paint 5 square meters.
   a. Calculate the area of the wall.

b. How many gallons does he need?

_____

_____

2. A farmer is planting grass in a rectangular garden, leaving a square space open for a fountain.



a. Calculate the area of the garden.

_____

b. Calculate the area of the fountain.

_____

_____

c. Deduce the number of square meters of grass needed for the garden.

_____

_____

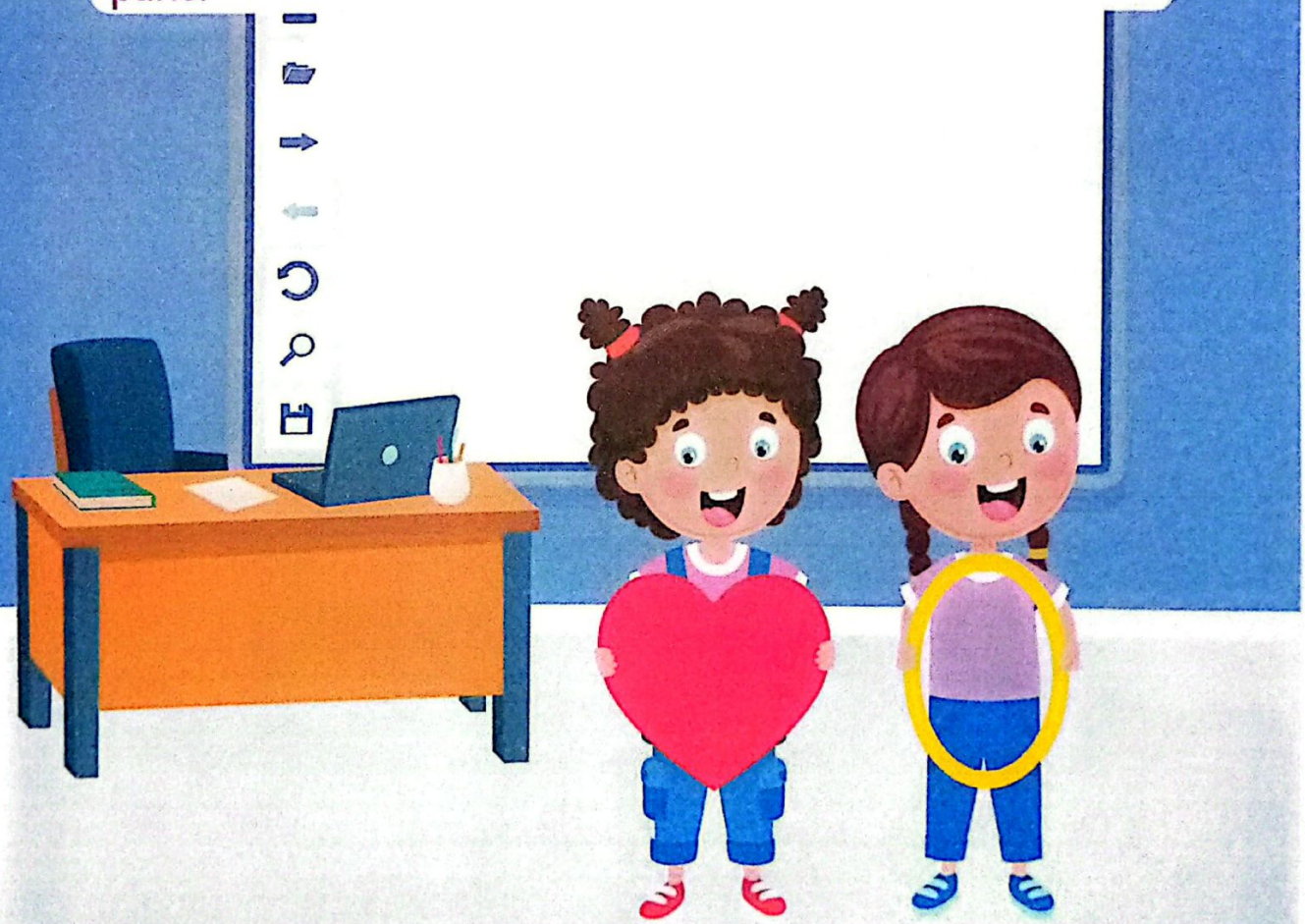
LESSON 23 LINE OF SYMMETRY

OBJECTIVES

- Recognize a line of symmetry for a 2-dimensional figure.
- Identify figures having lines of symmetry.
- Draw lines of symmetry for figures.

THINK

Jana holds a red heart-shaped paper, and Lyn holds a yellow zero-shaped paper.
Help each of Jana and Lyn fold their papers into two matching parts.

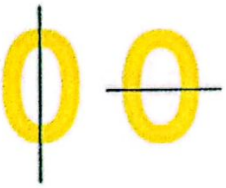


LEARN

A fold line or a line of symmetry is a line on which a figure can be folded into two matching parts of the same size and shape.

Jana: 

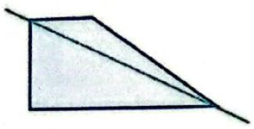
Jana's paper has one line of symmetry.

Lyn: 

Lyn's paper has more than one line of symmetry.
It has 2 lines of symmetry.

PRACTICE

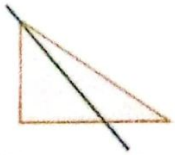
A. Which of the following green lines are lines of symmetry? Circle Yes or No.



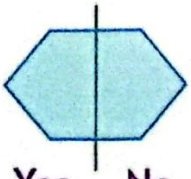
Yes No



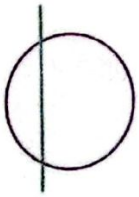
Yes No



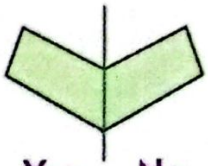
Yes No



Yes No



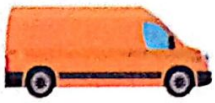
Yes No



Yes No

B. Does each shape show symmetry? Circle Yes or No. Draw a line of symmetry if there is one.

1. Objects:

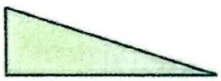
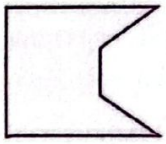





Yes No Yes No Yes No Yes No

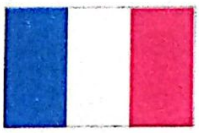
2. Polygons:



Yes No Yes No Yes No Yes No

3. Country flags:



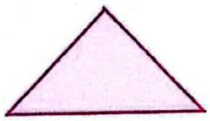


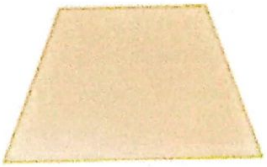


Yes No Yes No Yes No Yes No

C. Draw a line of symmetry for each shape.

1. Polygons:






2. Objects:






D. How many lines of symmetry does each quadrilateral have? Mark the correct answer. Then draw the lines of symmetry if they exist.

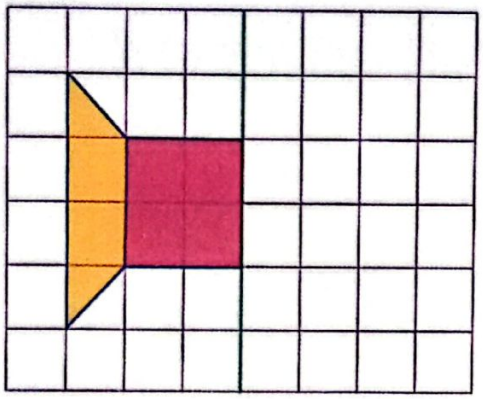
1. Square  ☐ 0 ☐ 2 ☐ 3 ☐ 4

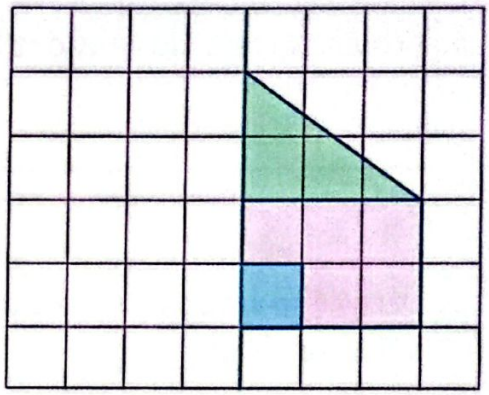
2. Rectangle  ☐ 0 ☐ 2 ☐ 3 ☐ 4

3. Parallelogram  ☐ 0 ☐ 2 ☐ 3 ☐ 4

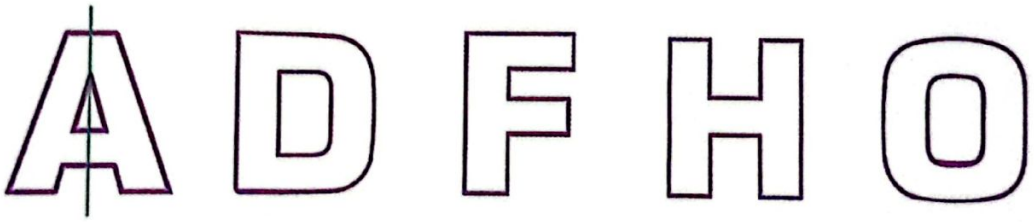
4. Rhombus  ☐ 0 ☐ 2 ☐ 3 ☐ 4

E. Draw the other half of each symmetrical shape. Then color it so that both parts match.

1. 

2. 

F. Consider the following capital letters.



I. Which letters show symmetry?

_____

2. Which letters have only one line of symmetry?

_____

3. Which letters have more than one line of symmetry?

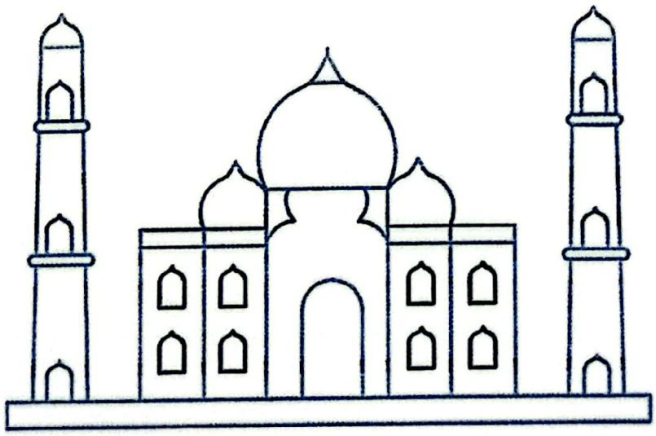
_____

4. Draw the lines of symmetry of the letters that are symmetrical.

G. Word Problem

The Taj Mahal, built in India, took about 16 years to complete. It was designed with perfect symmetry.

Draw a line of symmetry on the picture, and then color the picture symmetrically.



OBJECTIVES

- Make a frequency table and a line plot to display a data set of measurements (time, mass, liquid volume, and length).
- Use frequency tables and line plots to interpret data.

THINK

For a science project, the fourth graders recorded the heights of the plants to the nearest centimeter after 5 weeks of planting. The data are shown below.
How many plants are less than 17 centimeters in height?



Plant Height					
20	21	20	20	18	20
18	18	15	18	15	20

LEARN

A frequency table or a line plot can be used to organize the collected data.

Frequency Table

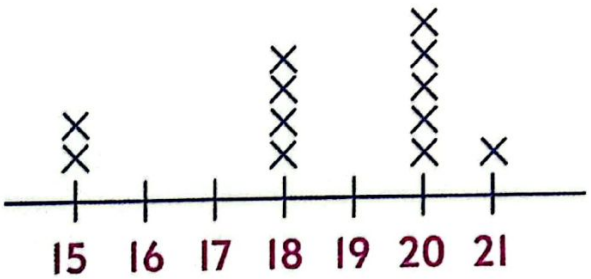
The frequency of a value is the number of times this value appears.

Count the number of plants corresponding to each height.

Plant Height (in cm)	15	18	20	21
Frequency	2	4	5	1

Line Plot

"×" represents one plant.

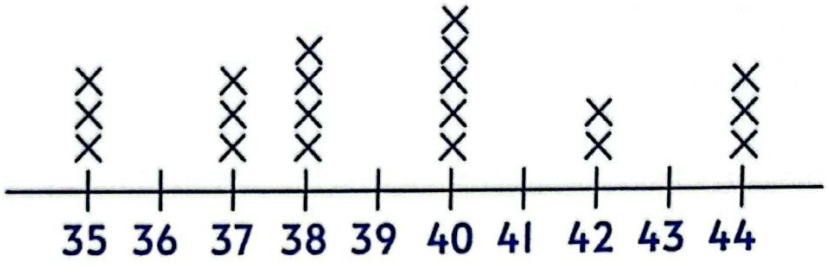


The frequency of plants with a height less than 17 centimeters = the frequency of 15-centimeter plants = 2.

Therefore, there are _____ plants less than 17 centimeters in height.

PRACTICE

A. The mass of the students in a class is shown on the line plot below. The mass unit is the kilogram.



Student Mass (in kg)

1. Find the total number of students in the class.

_____

2. Which mass is the most frequently recorded?

_____

3. Lyn said that half of the students weigh less than 39 kg. Is she right? Justify.

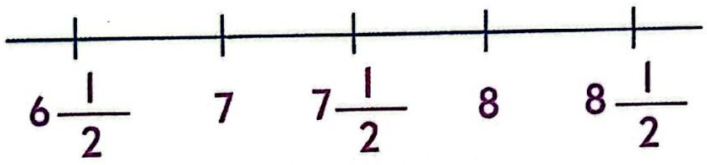
_____

_____

B. Tarek asked 28 persons about the number of hours they sleep each night. The data are collected in the frequency table below.

Number of Hours	$6\frac{1}{2}$	7	$7\frac{1}{2}$	8	$8\frac{1}{2}$
Frequency	4	9	5	7	3

1. Make a line plot using the above frequency table.



Number of Hours

2. Find the difference between the longest and shortest sleep durations.

_____

3. How many persons sleep more than 7 hours or less than $8\frac{1}{2}$ hours?

_____

4. How many fewer people sleep 8 hours than those who sleep $7\frac{1}{2}$ hours or less?

_____

_____

C. Jad bought a box of 20 oranges.
He squeezed them and measured the amount of juice in milliliters from each orange. He got the following results:
50, 52, 60, 60, 55, 60, 55, 52, 58, 52, 60, 50, 52, 52, 58, 55, 55, 60, 60, and 55.

1. Complete the frequency table representing the given data.

Amount of Juice (ml)	50	52	55	58	60
Frequency					

2. How many oranges have an amount of juice between 50 ml and 58 ml?

_____

3. Which amounts of juice are the least frequent?

_____

4. Jad said that the amount of juice in the oranges containing 50 ml or 60 ml of juice is 400 ml.
Do you agree? Justify.

_____

_____

D. Adam and his friends like to ride bikes. The frequency table below shows the distances they bike in kilometers.

Distance Biked (km)	0.8	1.0	1.2	2.1	2.5
Frequency	2	4	3	5	1

1. How many people bike less than 0.9 kilometers?

_____

2. How many people bike 1 kilometer or more?

_____

3. Find the number of people who bike 1.2 kilometers or 2.5 kilometers.

_____

4. How many more people bike between 1.1 and 2.7 kilometers than those who bike between 0.6 and 1.1 kilometers?

_____

_____

_____