45

Good transition book for those going into

5th Grade GT Math

Summer

Practice

Book

Name ______________________________

ALTERNATE STRATEGY 1

Graph It!

Graphs represent data visually and with numbers. You can use many different kinds of graphs to show data. Often one kind of graph is better for your data than another. Here are some ways to tell which graph to use.

Bar graphs show comparison by category.

Double-bar graphs allow you to compare more than one category at the same time.

Line graphs also show comparisons, but line graphs usually show comparisons over time.

Pictographs use symbols to show data. Pictographs can be hard to read if you have a great deal of data to show.

Stem-and-leaf plots allow you to see a range of data at a glance.

An example of each kind of graph is shown below.

Tell which kind of graph you would use to show the data below.

1. Five activities enjoyed by your classmates ______________________
2. The number of families by millions in the United States. ______________________
3. Changes over time in the sales of a certain automobile ______________________
4. To show the number of points won by soccer teams in a tournament ______________________
5. To compare three different schools for the number of students for each teacher ______________________
6. To compare sales of six kinds of pet food by millions of cans ______________________

Name ______________________________

ALTERNATE 2 STRATEGY

In the Millions

Here is how to read 7-, 8-, and 9-digit numbers. The numbers in front of the comma tell how many millions and thousands.

- Say the part in front of the first comma.
- Say the word **million.**
- Say the part in front of the second comma.
- Say the word **thousand.**
- Say the remaining numbers.

Example:

18, 246, 128 is said "18 million 246 thousand 128."

301, 200, 000 is said "301 million 200 thousand."

200, 425, 010 is said "200 million 425 thousand 10."

Write the number next to the correct word:

90, 900, 900	90, 900, 090	90, 090, 090
90, 009, 090	90, 200, 000	90, 360, 000

1. Ninety million two hundred thousand: ______________________
2. Ninety million three hundred sixty thousand: ______________________
3. Ninety million ninety thousand ninety: ______________________
4. Ninety million nine hundred thousand nine hundred: ______________________
5. Ninety million nine hundred thousand ninety: ______________________
6. Ninety million nine thousand ninety: ______________________

Name ______________________________

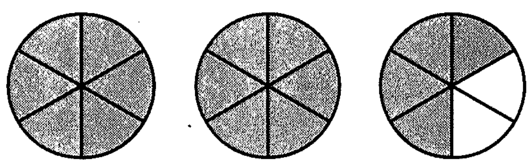
ALTERNATE STRATEGY 3

Pieces and Parts

You can write a fraction or mixed number to tell about a picture.

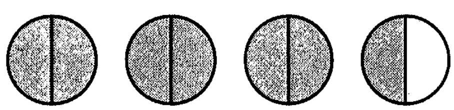
- In a mixed number, the whole number tells how many whole circles, and the fraction tells about the part of another circle.
- If you write a fraction, the bottom number, the denominator, tells how many parts each circle is divided into. The top number, the numerator, tells how many pieces are shaded altogether.

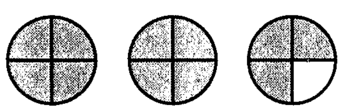
Example:

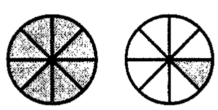


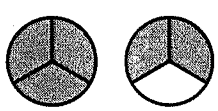
	Mixed Number		Fraction
=	$2\frac{4}{6}$	=	$\frac{16}{6}$

Write the fraction that tells about each picture.

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

2.  $= 2\frac{3}{4} = \frac{\square}{\square}$

3.  $= 1\frac{1}{8} = \frac{\square}{\square}$

4.  $= 1\frac{2}{3} = \frac{\square}{\square}$

Name ______________________________

ALTERNATE 5 STRATEGY

Looking at Sets

Here are ways to describe a set of numbers:

Range: the difference between the least number and the greatest number

Median: the number that is in the middle if you line up the numbers from least to greatest

Mode: the number that occurs the most times

Example:

Here are the ages of several children:

2 8 3 5 7 5 5 4 9

Put the numbers in order:

2 3 4 5 5 5 7 8 9

Circle the middle number. This is the median: 5.
The range is the difference between 2 and 9. The range is 7.
The mode is also 5. This is the number that appears the most.

Use the set below to complete the exercises.

Here are the ages of several adults:

29 37 24 52 81 30 23 37 82

Rewrite the numbers in order.

1. ___ ___ ___ ___ ___ ___ ___ ___ ___

Now find the median, range, and mode.

2. Median is ______ .

3. Range is ______ .

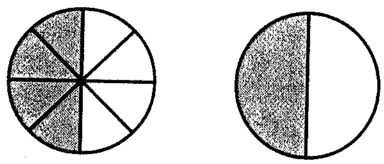
4. Mode is ______ .

Name ______________________________

ALTERNATE STRATEGY 4

Equal Parts

Equivalent fractions show the same part of an object.



$\frac{4}{8} = \frac{1}{2}$

Two fractions are equivalent if you multiply or divide the first fraction by a fraction equal to 1 and the answer is the second fraction.

Remember, a fraction that equals 1 has the same numerator or denominator. For example: $\frac{2}{2}$, $\frac{5}{5}$, $\frac{7}{7}$

$\frac{3}{4}$ is equivalent to $\frac{6}{8}$ because $\frac{3}{4} \times \frac{2}{2} = \frac{6}{8}$.

$\frac{6}{12}$ is not equivalent to $\frac{3}{4}$ because $\frac{6}{12} \div \frac{2}{3}$ is $\frac{3}{4}$.

The fraction used to divide with is not equal to 1.

For each pair of fractions, fill in the numbers you multiply or divide by. Then write **equivalent** or **not equivalent.** Remember, divide or multiply by a fraction that equals 1 to tell if the fractions are equivalent.

1. $\frac{3}{4} \times \frac{\square}{\square} = \frac{6}{12}$

____

2. $\frac{2}{3} \times \frac{\square}{\square} = \frac{8}{12}$

____

3. $\frac{12}{15} \div \frac{\square}{\square} = \frac{4}{5}$

____

4. $\frac{12}{15} \div \frac{\square}{\square} = \frac{2}{3}$

____

5. $\frac{1}{3} \times \frac{\square}{\square} = \frac{4}{15}$

____

6. $\frac{2}{5} \times \frac{\square}{\square} = \frac{6}{10}$

____

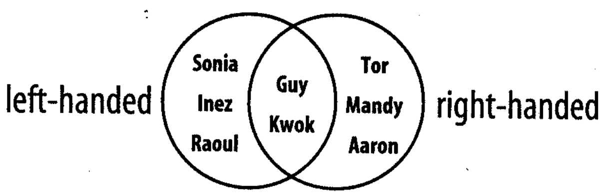
Name ____________________

ALTERNATE 6 STRATEGY

Venn Diagrams

You can use Venn diagrams to compare collections of numbers, people, or objects and their relationships.

- You make a Venn diagram by drawing two circles.
- The right and left of the diagram are labeled, but some of the items inside each circle have nothing in common.
- The overlapping middle shows items that have something in common with both the left and right circles.



Since Kwok is in the middle region he can write with either hand. Inez is in the circle for students who write with their left hand. Tor is in the circle for students who write with their right hand.

Answer the following questions about the diagram.

1. Who writes with their right hand? ____________________
2. Who writes with their left hand? ____________________
3. Who can write with either hand? ____________________

Draw a Venn diagram for each set of statements.

4. Use at least 10 numbers to show common multiples of 2 and 4.
5. a. Morris, and Oscar have a fish and a dog.

   b. Keeelung, Grover, and Bob each have a dog.

   c. Keesha, Greg, and Aiisha each have a fish.
6. Use at least 10 numbers that are divisible by 3 and 4.

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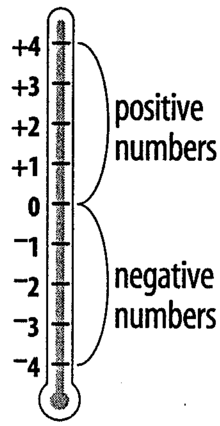
ALTERNATE STRATEGY 7

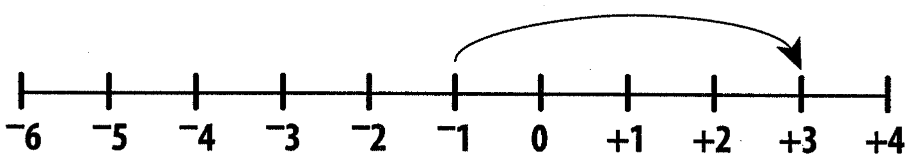
Negative and Positive

Here is a thermometer that shows the temperature above zero and below zero.



Notice how temperatures change between positive numbers and negative numbers.

Example:



If the temperature goes from $^{-}1$ to + 3, we move up 4 spaces. That tells us the temperature went up 4 degrees.

Use the number line to answer each question:

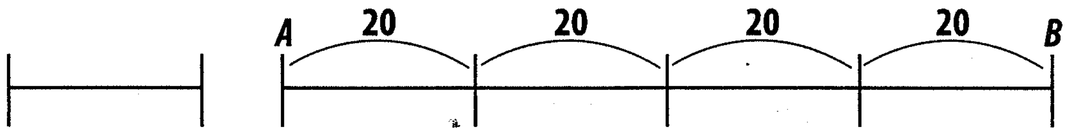
1. Start at $^{-}2$ and go to +3. How many degrees did you go up? _____
2. Start at +3 and go to $^{-}1$. How many degrees did you go down? _____
3. Start at $^{-}2$ and go to 0. How many degrees did you go up? _____
4. Start at +3 and go to $^{-}6$. How many degrees did you go down? _____
5. Start at +4 and go to $^{-}4$. How many degrees did you go down? _____

Name ______________________

ALTERNATE STRATEGY 9

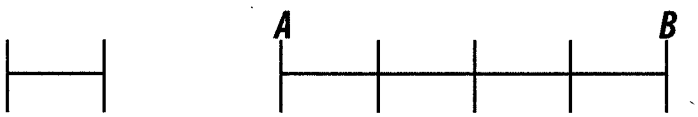
Using a Map Scale

Every map has a scale. The scale tells how far apart points are on the map. Different maps have different scales. Here is a map scale and an example of using it.



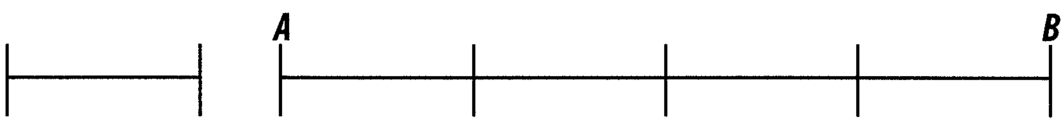
1 inch = 20 miles **The distance from *A* to *B* is 80 miles.**

For each map scale, write the distance from *A* to *B* on a map using that map scale.

1. 

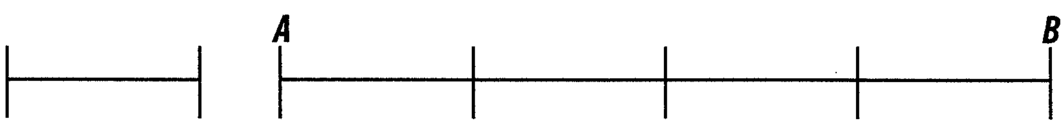
$\frac{1}{2}$ inch = 50 miles

The distance from *A* to *B* is ______________________.

2. 

1 inch = 10 miles

The distance from *A* to *B* is ______________________.

3. 

1 inch = 25 miles

The distance from *A* to *B* is ______________________.

4. 

$\frac{1}{2}$ inch = 25 miles

The distance from *A* to *B* is ______________________.

Name ______________________________

ALTERNATE 8 STRATEGY

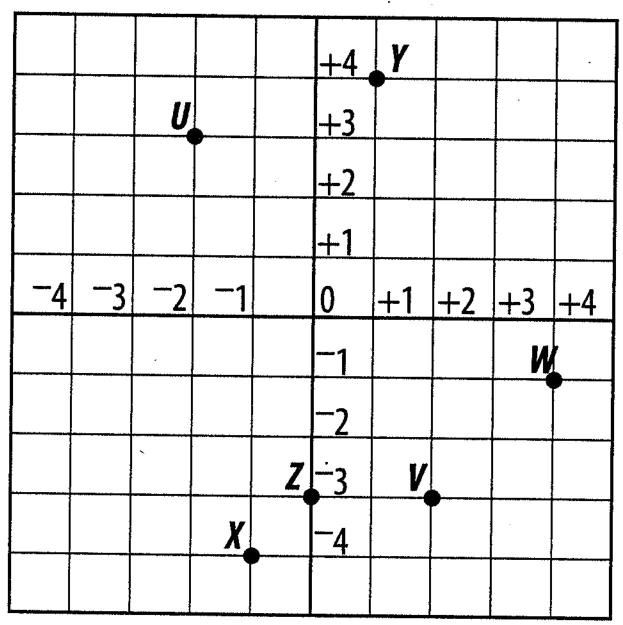
Plotting Points

You can write two numbers to describe a point on the graph.

The first number tells how many spaces across from the zero. Positive (+) numbers go to the right. Negative (−) numbers go to the left.

The second number tells how many spaces up or down from the zero. Positive (+) numbers go up. Negative (−) numbers go down.

Point *U* is (−2, +3). That means it is 2 spaces across in the negative direction and 3 spaces up in the positive direction.



Use the graph to match points U–Z with the coordinates listed below.

1. *U* ________	a. (+4, −1)
2. *V* ________	b. (−1, −4)
3. *W* ________	c. (−2, +3)
4. *X* ________	d. (+1, +4)
5. *Y* ________	e. (+0, −3)
6. *Z* ________	f. (+2, −3)

Name ______________________________

ALTERNATE 10 STRATEGY

Using Variables

In an equation if a **variable** (letter) is next to a number, it means multiply. When you read the equation, you can say, "What number?" for the variable.

Example:

$3a = 15$ means 3 times what number equals 15?

$a = 5$ is the solution to this equation.

Sometimes an exercise will tell you what number to use for the variable. Just cross out the letter and write the number.Then perform the multiplication.

If $a = 6$, then $3a$ means 3×6 which equals 18.

For each exercise. Use the given value of the variable to make a true statement, or find the value of the variable that will solve the equation.

1. $r = 12$ $3r =$ ____	**2.** $n = 4$ $5n =$ ____	**3.** $2a = 20$ $a =$ ____
4. $d = 20$ $5d =$ ____	**5.** $4x = 32$ $x =$ ____	**6.** $7b = 56$ $b =$ ____
7. $y = 16$ $4y =$ ____	**8.** $9h = 45$ $h =$ ____	**9.** $6p = 66$ $p =$ ____

Name ______________________________

ALTERNATE STRATEGY 11

Factor Trees

Here are some hints about using factor trees to find the prime factorization of a number.

- Treat it like a game.
- The idea is to make a multiplication problem with as many small numbers as possible.
- Keep trying to find smaller numbers to multiply.
- Stop when all the numbers are prime.

48

12   4 = 48

3   4   2   2 = 48

$3 \times 2 \times 2 \times 2 \times 2 = 48$

Fill in the missing numbers.

1. 12

$\boxed{} \times \boxed{3} = 12$

$\boxed{} \times \boxed{} \times \boxed{} = 12$

2. 24

$\boxed{6} \times \boxed{4} = 24$

$\boxed{} \times \boxed{} \times \boxed{} \times \boxed{} = 24$

3. 36

$\boxed{9} \times \boxed{4} = 36$

$\boxed{} \times \boxed{} \times \boxed{} \times \boxed{} = 36$

4. 40

$\boxed{10} \times \boxed{}$

$\boxed{} \times \boxed{} \times \boxed{} \times \boxed{}$

5. 28

$\boxed{14} \times \boxed{2}$

$\boxed{} \times \boxed{} \times \boxed{2}$

6. 64

$\boxed{8} \times \boxed{8}$

$\boxed{} \times \boxed{2} \times \boxed{} \times \boxed{2}$

$\boxed{} \times \boxed{} \times \boxed{} \times \boxed{} \times \boxed{} \times \boxed{}$

Name ______________________________

ALTERNATE 13 STRATEGY

Add and Subtract Fractions

Here is how to add and subtract numbers with different denominators.

- Find a common denominator, any number you can reach when you count by either denominator.
- Multiply each fraction by a fraction that equals 1 to find an equivalent fraction with the new denominator.
- Add or subtract the rewritten fractions.

$$\frac{3}{4}\left(\ \right) = 12$$
$$+\frac{2}{6}\left(\ \right) = 12$$

$$\frac{3}{4}\left(\frac{3}{3}\right) = \frac{9}{12}$$
$$+\frac{2}{6}\left(\frac{2}{2}\right) = \frac{4}{12}$$
$$\frac{13}{12} = 1\frac{1}{12}$$

Add or subtract, put answers in simplest terms.

1. $\frac{3}{5}\left(\frac{2}{2}\right) = \frac{\square}{10}$

$+\frac{2}{10}\left(\frac{1}{1}\right) = \frac{\square}{10}$

____

2. $\frac{2}{4}\left(\frac{3}{3}\right) = \frac{\square}{12}$

$-\frac{1}{6}\left(\frac{\ }{2}\right) = \frac{\square}{12}$

____

3. $\frac{7}{9}\left(\frac{1}{1}\right) = \frac{\square}{9}$

$-\frac{2}{3}\left(\frac{\ }{3}\right) = \frac{\square}{9}$

____

4. $\frac{1}{3}\left(\frac{\square}{\square}\right) = \frac{\square}{\square}$

$+\frac{2}{4}\left(\frac{\square}{\square}\right) = \frac{\square}{\square}$

____

5. $\frac{9}{10}\left(\frac{\square}{\square}\right) = \frac{\square}{\square}$

$-\frac{1}{2}\left(\frac{\square}{\square}\right) = \frac{\square}{\square}$

____

6. $\frac{1}{1}\left(\frac{\square}{\square}\right) = \frac{\square}{\square}$

$+\frac{1}{4}\left(\frac{\square}{\square}\right) = \frac{\square}{\square}$

____

Name ______________________________

ALTERNATE 12 STRATEGY

The Greatest Common Factor

The **greatest common factor** (GCF) is the largest number that is a factor of two or more other numbers. Here is one way to find the GCF:

- Find the prime factorization for each number.
- Circle the factors that are the same.
- Multiply one of each of the circled pairs.

Example:

24 = **2** × **2** × **2** × **3** Circle the two pairs of 2's.

36 = **2** × **2** × **3** × **3** Circle one pair of 3's.

Multiply 2 × 2 × 3, the GCF of 24 and 36 is 12.

For each pair of numbers, write the prime factorization of each number, circle the pairs of numbers that are the same, then multiply to find the GCF.

1. 12 = ____________

15 = ____________

GCF = ____________

2. 10 = ____________

30 = ____________

GCF = ____________

3. 20 = ____________

45 = ____________

GCF = ____________

4. 14 = ____________

21 = ____________

GCF = ____________

5. 18 = ____________

30 = ____________

GCF = ____________

6. 32 = ____________

42 = ____________

GCF = ____________

Name ______________________________

ALTERNATE 14 STRATEGY

Regrouping Mixed Numbers

Sometimes you have to regroup when you do subtraction problems with mixed numbers. Look at the example below to learn how.

- Cross out the whole number and write a whole number that is one less. $\overset{4}{\cancel{5}}\frac{3}{8}$
- Write a fraction equal to one whole that has the same denominator as the fraction. Remember that a fraction equals one when the numerator and denominator are the same. $4\frac{3}{8} + \frac{8}{8} =$
- Add the fractions and write the rewritten mixed number. $4\frac{11}{8}$

Regroup each mixed number.

1. $6\frac{2}{3} = 5\frac{\square}{3}$
2. $9\frac{2}{7} = 8\frac{\square}{7}$
3. $3\frac{5}{7} = 2\frac{\square}{7}$
4. $6\frac{1}{3} = 5\frac{\square}{3}$
5. $8\frac{7}{9} =$ ______
6. $3\frac{3}{10} =$ ______
7. $4\frac{3}{5} =$ ______
8. $9\frac{2}{3} =$ ______
9. $10\frac{2}{5} =$ ______
10. $8\frac{2}{3} =$ ______
11. $1\frac{3}{8} =$ ______
12. $4\frac{5}{12} =$ ______

Name ______________________________

ALTERNATE 17 STRATEGY

Powers of 10

You can use **exponents** whenever you multiply 10 by itself. For example:

10^2 means you multiply 10×10, or 100.

10^3 means you multiply $10 \times 10 \times 10$, or 1,000.

10^4 means you multiply $10 \times 10 \times 10 \times 10$, or 10,000.

The small number next to the ten is called the exponent. It indicates the number of times 10 is multiplied by itself. It also indicates the number of zeros that follow 1.

10^3 means there are 3 zeros after 1, or 1,000.

10^6 means there are 6 zeros after 1, or 1,000,000.

Write the number for each item.

1. $10^2 =$ ____________ **2.** $10^7 =$ ____________

3. $10^5 =$ ____________ **4.** $10^4 =$ ____________

5. $10^3 =$ ____________ **6.** $10^8 =$ ____________

Match the exponent with the number it equals.

7. 10^5 ______ **a.** 100,000

8. 10^2 ______ **b.** 1,000,000

9. 10^3 ______ **c.** 10

10. 10^6 ______ **d.** 1,000

11. 10^1 ______ **e.** 10,000

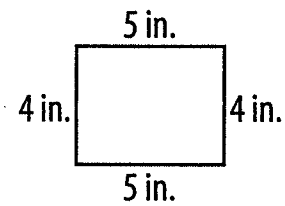
12. 10^4 ______ **f.** 100

Name ____________________

ALTERNATE 19 STRATEGY

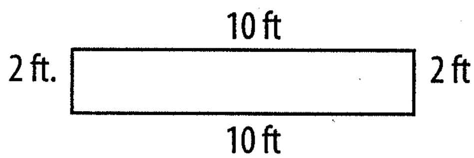
Getting Around Perimeter

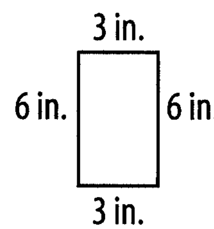
Perimeter is the distance around the outside of a figure.



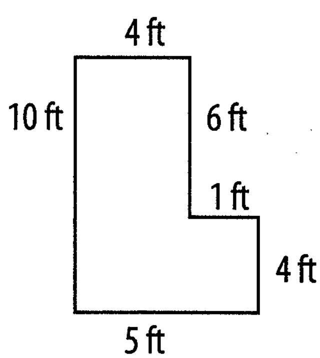
perimeter = 5 + 4 + 5 + 4 = 18 in.

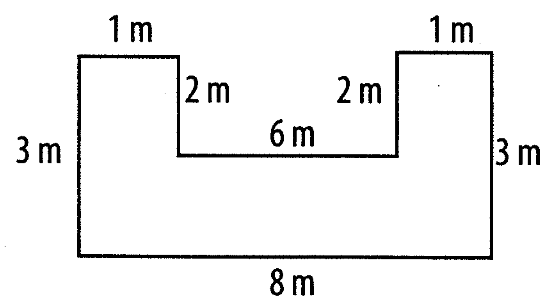
Find the perimeter of each shape below.



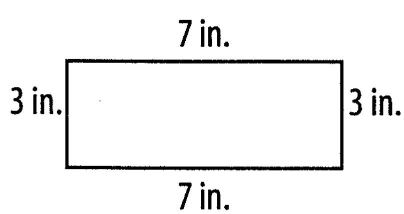


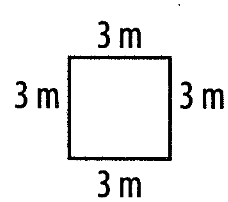
1. perimeter = ____________________ **2.** perimeter = ____________________





3. perimeter = ____________________ **4.** perimeter = ____________________





5. perimeter = ____________________ **6.** perimeter = ____________________

Name ______________________

ALTERNATE 18 STRATEGY

Big Numbers, Little Names

Try using exponents to write large numbers. For example:

$8{,}000{,}000 = 8 \times 1{,}000{,}000 = 8 \times 10^6$

$200{,}000 = 2 \times 100{,}000 = 2 \times 10^5$

$15{,}000 = 15 \times 1{,}000 = 15 \times 10^3$

Rewrite each number.

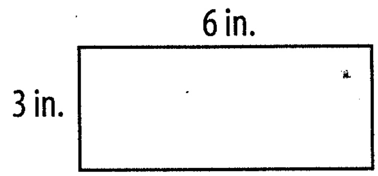
			Multiplication	Using Exponents
	90,000,000	=	$9 \times 10{,}000{,}000$	9×10^7
1.	1,400,000	=		
2.	8,000,000	=		
3.	2,400	=		
4.	70,000	=		
5.	5,000,000,000	=		
6.	830,000,000	=		
7.	450,000	=		
8.	11,000,000,000	=		
9.	200,000,000	=		
10.	3,000	=		
11.	4,000,000	=		
12.	600	=		

Name ____________________

ALTERNATE 20 STRATEGY

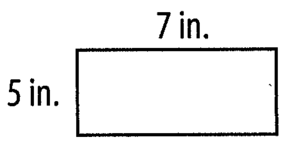
Inside the Perimeter

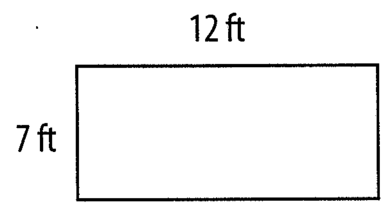
Area is the space found inside the perimeter of a shape. You can find the area of a rectangle by multiplying length times width. Your answer will always be expressed in terms of square units. Square inches is written **in.^{2}**



area = length × width
length = 6 in. width = 3 in.
area = 6 in. × 3 in.
area = 18 in.^{2}

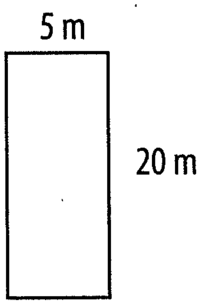
Find the area of each shape below.

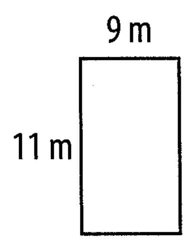




1. area = ____________________

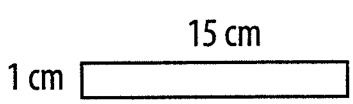
2. area = ____________________

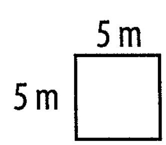




3. area = ____________________

4. area = ____________________





5. area = ____________________

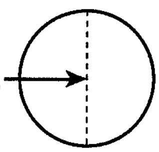
6. area = ____________________

Name ______________________________

21 ALTERNATE STRATEGY

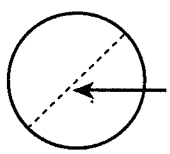
Getting Around Circles

The distance around a circle is called the **circumference.** To calculate it you must know the circle's **diameter.** The diameter is a line that passes through a circle's center connecting two points on the edge. Multiply the diameter by 3.14 to find the circumference.

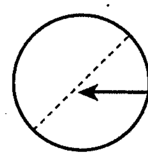


circumference = diameter × 3.14
circumference = 4 × 3.14
circumference = 12.56 in.

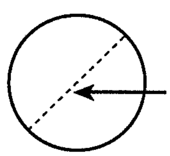
Find the circumference of the circle.



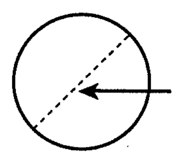
1. circumference = ______________



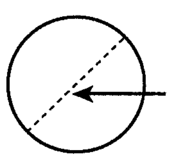
2. circumference = ______________



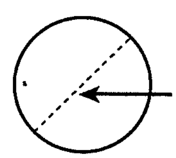
3. circumference = ______________



4. circumference = ______________



5. circumference = ______________



6. circumference = ______________

Name ______________________________

ALTERNATE 23 STRATEGY

Divide with Multiplication

Using multiplication can sometimes help you divide. Begin by asking yourself what number must you multiply your divisor by to get your dividend.

For example, when you divide $.3\overline{)3.6}$ you might think about what whole number times .3 is close to 3.6. You know that $.3 \times 10 = 3.0$. This tells you that your answer must be bigger than 10. Try 11. $11 \times .3 = 3.3$. The answer is still a little bigger. Try 12. $12 \times .3 = 3.6$. The answer is 12.

Use multiplication to help you with these divisions.

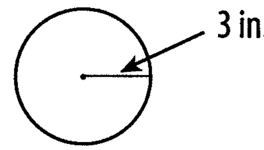
1. $.2\overline{)8.4}$
2. $.4\overline{)3.2}$
3. $.05\overline{)14.8}$
4. $.05\overline{)54.5}$
5. $.7\overline{)2.1}$
6. $.7\overline{)16.1}$
7. $.08\overline{)3.20}$
8. $.3\overline{)2.4}$
9. $.3\overline{)3.6}$

Name ______________________________

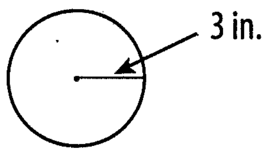
ALTERNATE 22 STRATEGY

In the Area of a Circle

The area of a circle is the space inside the circumference. The formula for finding area is $A = 3.14 \times r^2$. In this formula, r equals the circle's **radius.** The radius is a straight line from the middle of the circle to an edge. You know from working with powers of 10 that 10^2 is another way of saying 10×10. Similarly, r^2 means you multiply $r \times r$.



Example:

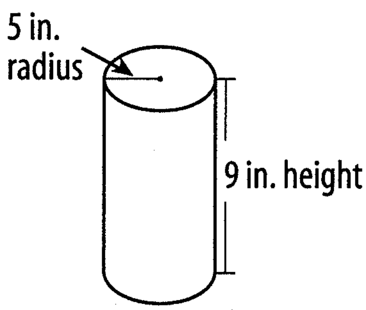


$A = 3.14 \times r^2$
$A = 3.14 \times (3 \times 3)$
$A = 28.26 \text{ in.}^2$

The volume of a cylinder is the space inside it. Volume is measured in cubic units. Cubic inches is written **in.³** You can use what you know about the area of a circle to find the volume of a cylinder.

You know that the base of a cylinder is a circle. To find the cylinder's volume you multiply the area of the circle by the height of the cylinder.

Example:



volume $= 3.14 \times r^2 \times h$
volume $= 3.14 \times (5 \times 5) \times 9$
volume $= 706.5 \text{ in.}^3$

Given r, find the area of the circle.

1. $r = 4$ in. ______________________
2. $r = 12$ ft ______________________
3. $r = 31$ m ______________________
4. $r = 19$ ft ______________________

Given r and h find the cylinder's volume.

5. $r = 4$ in., $h = 11$ in. ______________________
6. $r = 7$ ft, $h = 22$ ft ______________________
7. $r = 20$ m, $h = 10$ m ______________________
8. $r = 30$ ft, $h = 12$ ft ______________________

Name ______________________________

ALTERNATE STRATEGY 24

Make It Whole

You can simplify decimal division by using powers of 10. Begin any decimal division by asking yourself what power of ten will change your divisor into a whole number. Remember that whatever you do on one side of the division sign must also be done on the other side.

For example, you can change $.03\overline{)27}$ into a whole number division by multiplying both sides of the division sign by 100. You know that $.03 \times 100 = 3$. If you multiply .03 by 100, you also must multiply 27 by 100. When you do this you get $3\overline{)2{,}700}$. Now you can solve this whole number division. The answer is 900.

Use what you know about powers of ten to help you solve these divisions.

1. $.02\overline{)4.624}$
2. $.05\overline{).435}$
3. $2.4\overline{)4.8}$
4. $.003\overline{)18.6}$
5. $.006\overline{)3.6}$
6. $1.7\overline{).51}$
7. $.09\overline{)6.39}$
8. $.25\overline{)1.5}$
9. $.8\overline{).56}$

Name ____________________

ALTERNATE STRATEGY 25

Upside Down Numbers

Two numbers are **reciprocal** numbers if their product is 1.

- Here are two pairs of reciprocal numbers.

  $\frac{2}{3}$ and $\frac{3}{2}$ are reciprocal. $\frac{2}{3} \times \frac{3}{2} = \frac{6}{6} = 1$

  $\frac{2}{8}$ and $\frac{8}{2}$ are reciprocal. $\frac{2}{8} \times \frac{8}{2} = \frac{16}{16} = 1$

Here's how to find the reciprocal of a whole number.

- Write the whole number as a fraction with a denominator of 1.
- Invert the fraction.

Example: $7 = \frac{7}{1}$; the reciprocal of 7 is $\frac{1}{7}$.

For Exercises 1–12, write the reciprocal of each number.

1. 4 ________ **2.** $\frac{3}{8}$ ________ **3.** 5 ________ **4.** $\frac{9}{2}$ ________

5. $\frac{6}{7}$ ________ **6.** $\frac{12}{25}$ ________ **7.** $\frac{3}{4}$ ________ **8.** $\frac{5}{6}$ ________

9. 1 ________ **10.** $1\frac{1}{2}$ ________ **11.** $4\frac{4}{5}$ ________ **12.** $\frac{7}{8}$ ________

13. List the numbers in Exercises 1–12 greater than 1.

____

14. List the reciprocal numbers less than 1.

____

Name ________________________________

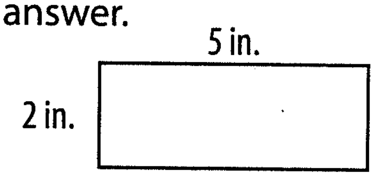
ALTERNATE STRATEGY 27

Many-sided Area

Here is how to find the area of some polygons. Be sure to write the word *square* in front of the unit in the answer.

- **Rectangle:** Multiply the length times the width.

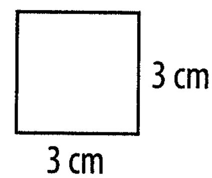
Area = $l \times w$



Area = 5 × 2 = 10 square in.

- **Square:** Multiply the side times itself. Remember, the length and the width of a square are the same.

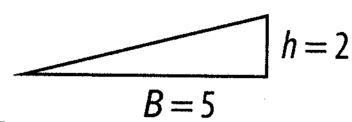
Area = s^2



Area = 3 × 3 = 9 square cm

- **Triangle:** Multiply $\frac{1}{2}$ times the base times the height.

Area = $\frac{1}{2} B h$



Area = $\frac{1}{2}$ × 5 × 2 = 5 square units

Write the multiplication sentence for each area. Then find the area.

1. A square, side = 2 in. ____________________
2. A triangle, base = 6, height = 3 ____________________
3. A rectangle 3 ft wide , 4 ft long ____________________
4. A polygon 2 yd wide, 7 yd long ____________________
5. A triangle, base = 4, height = 5 ____________________
6. A rectangle, length = 4, width = 5 ____________________
7. A square, side = 8 m ____________________

Name ____________________

ALTERNATE 26 STRATEGY

Multiply the Same Number

An **exponent** is a way to show how many times to multiply a number by itself. An exponent is written as a smaller number above the number to multiply.

- The exponent in n^2 indicates you should multiply the number by itself two times.

  $3^2 = 3 \times 3 = 9$ $\qquad$ $5^2 = 5 \times 5 = 25$

- The product of a factor and itself is called a **square number**. The factor that is multiplied by itself is called the **square root**. The symbol for square root is $\sqrt{}$.

  In the examples above, $3 = \sqrt{9}$ and $5 = \sqrt{25}$.
  3 and 5 are square roots, 9 and 25 are square numbers.

For Exercises 1–8 write how many times each factor should be multiplied. Then find the product.

1. 4^2 = ____________ = ______ $\qquad$ **2.** 10^2 = ____________ = ______

3. 5^3 = ____________ = ______ $\qquad$ **4.** 4^4 = ____________ = ______

5. 3^5 = ____________ = ______ $\qquad$ **6.** 2^5 = ____________ = ______

7. 9^2 = ____________ = ______ $\qquad$ **8.** 7^2 = ____________ = ______

For Exercises 9–17 find the square root.

9. $\sqrt{4}$ = ______ $\qquad$ **10.** $\sqrt{100}$ = ______ $\qquad$ **11.** $\sqrt{64}$ = ______

12. $\sqrt{25}$ = ______ $\qquad$ **13.** $\sqrt{16}$ = ______ $\qquad$ **14.** $\sqrt{81}$ = ______

15. $\sqrt{49}$ = ______ $\qquad$ **16.** $\sqrt{25}$ = ______ $\qquad$ **17.** $\sqrt{36}$ = ______

Name ______________________________

ALTERNATE 28 STRATEGY

Multiplying Mixed Numbers

Here's how to multiply a mixed number.

- First, multiply the whole numbers.
- Second, multiply the fractions.
- Third, multiply each whole number by the opposite fraction.
- Last, add all the products.

Example: $2\frac{1}{2} \times 4\frac{1}{4} =$

First	2	×	4	=	8
Second	$\frac{1}{2}$	×	$\frac{1}{4}$	=	$\frac{1}{8}$
Third	$\frac{1}{2}$	×	4	=	2
	$\frac{1}{4}$	×	2	=	$\frac{1}{2}$

Last, add the products: $8 + \frac{1}{8} + 2 + \frac{1}{2} = 10 + \frac{1}{8} + \frac{1}{2} = 10\frac{5}{8}$

Write out each step you use to find the product.

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

(____ × ____) + (____ × ____) + (____ × ____) + (____ × ____) = ________

2. $1\frac{1}{5} \times 5\frac{1}{5} =$

(____ × ____) + (____ × ____) + (____ × ____) + (____ × ____) = ________

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

(____ × ____) + (____ × ____) + (____ × ____) + (____ × ____) = ________

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

(____ × ____) + (____ × ____) + (____ × ____) + (____ × ____) = ________

Name ______________________________

Alternate Strategy 33

Ratios as Fractions

A **ratio** is a comparison of two quantities. You can write a ratio as a fraction:

- You can buy 5 apples for 2 dollars:

$$\frac{5\text{ apples}}{2\text{ dollars}}$$

- You get 3 rides for each ticket:

$$\frac{3\text{ rides}}{1\text{ ticket}}$$

Write the ratio for each sentence.

1. Rosa can run 500 yards in 2 minutes. __________
2. Aran fixed 7 radios in 2 hours. __________
3. There are 7 pencils in 1 package. __________
4. A baker used 210 eggs to make 70 pies. __________
5. The factory used 900 buttons to make 150 shirts. __________
6. A teacher bought 120 rulers for 4 classes. __________
7. Keke sold 2 gallons each hour. __________
8. A spider has 8 legs. __________
9. There are 1,200 pages in 4 volumes. __________

Name ______________________________

ALTERNATE 31 STRATEGY

Divide by a Fraction

Here is a fast way to divide a whole number by a fraction.

- Invert the fraction.
- Multiply.

Example:

$6 \div \frac{1}{3} =$

$6 \times \frac{3}{1} = 6 \times 3 = 24$

Your quotient may be greater than the numbers you divided.

Show the steps you use to find each quotient.
Remember to write your answer in lowest terms.

1. $5 \div \frac{1}{4} =$ ______________ = ______
2. $3 \div \frac{1}{2} =$ ______________ = ______
3. $2 \div \frac{1}{5} =$ ______________ = ______
4. $6 \div \frac{1}{2} =$ ______________ = ______
5. $6 \div \frac{1}{4} =$ ______________ = ______
6. $6 \div \frac{1}{5} =$ ______________ = ______
7. $5 \div \frac{1}{5} =$ ______________ = ______
8. $9 \div \frac{2}{9} =$ ______________ = ______
9. $12 \div \frac{3}{5} =$ ______________ = ______
10. $4 \div \frac{5}{6} =$ ______________ = ______
11. $10 \div \frac{3}{5} =$ ______________ = ______
12. $8 \div \frac{2}{3} =$ ______________ = ______

Name ______________________________

ALTERNATE STRATEGY 34

Two Names for One Ratio

Ratios are **equivalent** when you can multiply or divide each by a fraction equal to 1 and end up with the other ratio.

A fraction is equal to 1 when it has the same numerator and denominator. Here are some fractions that equal 1:

$$\frac{2}{2} \quad \frac{3}{3} \quad \frac{4}{4} \quad \frac{5}{5} \quad \frac{6}{6} \quad \frac{7}{7} \quad \frac{8}{8} \quad \frac{9}{9} \quad \frac{10}{10} \quad \frac{15}{15} \quad \frac{20}{20}$$

The ratio $\frac{3}{5}$ is equivalent to $\frac{6}{10}$ and $\frac{9}{15}$.

$$\frac{3}{5} \times \frac{2}{2} = \frac{6}{10} \qquad \frac{3}{5} \times \frac{3}{3} = \frac{9}{15}$$

Write the fraction to create an equivalent ratio.

1. $\frac{3}{5} \times \frac{4}{4} = \frac{\square}{\square}$

2. $\frac{7}{8} \times \frac{6}{6} = \frac{\square}{\square}$

3. $\frac{2}{9} \times \frac{9}{9} = \frac{\square}{\square}$

4. $\frac{3}{5} \times \frac{\square}{\square} = \frac{15}{25}$

5. $\frac{3}{4} \times \frac{\square}{\square} = \frac{12}{16}$

6. $\frac{5}{6} \times \frac{\square}{\square} = \frac{25}{30}$

7. $\frac{\square}{\square} \times \frac{6}{6} = \frac{18}{30}$

8. $\frac{\square}{\square} \times \frac{3}{3} = \frac{9}{15}$

9. $\frac{\square}{\square} \times \frac{5}{5} = \frac{10}{15}$

Name ______________________________

ALTERNATE 32 STRATEGY

More Fraction Divisors

You already know how to divide a fraction by a fraction. You use the same steps you use to divide a whole number by a fraction.

- Invert the fraction you are dividing by.
- Multiply.

Example:

$\frac{1}{6} \div \frac{1}{3} =$

$\frac{1}{6} \times \frac{3}{1} = \frac{1}{6} \times 3 = \frac{3}{6} = \frac{1}{2}$

Your quotient maybe greater than the numbers you divided.

Show the steps you use to find each quotient. Remember to write your quotient in lowest terms.

1. $\frac{1}{5} \div \frac{1}{4} =$ ______________________ = ______

2. $\frac{3}{4} \div \frac{1}{2} =$ ______________________ = ______

3. $\frac{1}{2} \div \frac{1}{5} =$ ______________________ = ______

4. $\frac{5}{6} \div \frac{1}{2} =$ ______________________ = ______

5. $\frac{6}{7} \div \frac{1}{4} =$ ______________________ = ______

6. $\frac{2}{3} \div \frac{1}{5} =$ ______________________ = ______

7. $\frac{5}{7} \div \frac{1}{5} =$ ______________________ = ______

8. $\frac{3}{4} \div \frac{2}{9} =$ ______________________ = ______

9. $\frac{4}{5} \div \frac{3}{5} =$ ______________________ = ______

10. $\frac{2}{3} \div \frac{5}{6} =$ ______________________ = ______

11. $\frac{7}{8} \div \frac{3}{5} =$ ______________________ = ______

12. $\frac{8}{9} \div \frac{2}{3} =$ ______________________ = ______

Name ______________________________

ALTERNATE STRATEGY 37

Make the Proportion

A pair of equivalent fractions is a **proportion.** This proportion shows the ratio of boys to children in two groups is the same.

$$\frac{\text{boys}}{\text{children}} \quad \frac{3}{7} = \frac{12}{28}$$

One group has 3 boys for every 7 children. The other has 12 boys out of 28 children.

You can figure out a missing number in a proportion by multiplying the numerator and denominator by the same number.

$$\frac{3}{7} = \frac{\square}{28} \qquad \frac{3}{7} \times \frac{4}{4} = \frac{\boxed{12}}{28}$$

Write the missing numbers to make proportions.

1. $\frac{2}{5} \times \frac{3}{\square} = \frac{\square}{15}$

2. $\frac{1}{3} \times \frac{4}{\square} = \frac{\square}{12}$

3. $\frac{4}{7} \times \frac{\square}{4} = \frac{16}{\square}$

4. $\frac{2}{9} \times \frac{\square}{5} = \frac{10}{\square}$

5. $\frac{1}{6} \times \frac{2}{\square} = \frac{\square}{12}$

6. $\frac{7}{8} \times \frac{\square}{6} = \frac{42}{\square}$

7. $\frac{9}{10} \times \frac{\square}{6} = \frac{54}{\square}$

8. $\frac{7}{9} \times \frac{9}{\square} = \frac{\square}{81}$

Name ______________________________

ALTERNATE STRATEGY 43

Percents and Sales

You can use proportions to work discount problems with percent. First find the regular price and sale price of the item. Then set up and solve a proportion with two ratios.

- The first ratio tells about the dollars. It shows how much you save and what the original price was.
- The second ratio has n as the percent. Remember, percent means how many out of 100.

Example:

A coat is on sale for \$35. It usually costs \$50. What percent of the old price do you save?

If the old price is \$50, you save \$15. To solve the proportion, you can write an equation. Or you can multiply by a fraction equal to 1, as shown here. The answer is 30 percent.

Dollars | **Percent**

$$\begin{array}{rcc} & \textbf{Dollars} & \textbf{Percent} \\ \textbf{Savings} & 15 & n \\ \textbf{Old price} & \overline{50} & = \overline{100} \end{array}$$

$$\frac{15}{50} \times \frac{2}{2} = \frac{30}{100}$$

Set up and solve a proportion. Record your work. Write the percent of savings in the box.

1. A shirt is on sale. Usually it costs \$20. Today it costs \$15. What percent are you saving? The answer is ☐ percent.

2. A table is on sale. Usually it costs \$25. Today it costs \$20. What percent are you saving? The answer is ☐ percent.

3. A coat is on sale. Today it costs only \$30. Usually it costs \$50. What percent are you saving? The answer is ☐ percent.