Name ____________________

• Problems About Combining
• Problems About Separating

- To solve word problems about combining or separating:
  1. Identify an addition or subtraction pattern (the plot).
  2. Write an equation for the given information.
  3. Solve for the unknown numbers.
  4. Check to see if the answer makes sense.

Some, Some More $s + m = t$	some ← If missing, subtract. + some more ← If missing, subtract. total ← If missing, add.
Some, Some Went Away $b - a = r$	some ← If missing, add. − some went away ← If missing, subtract. what's left ← If missing, subtract.

Practice:

1. Marge spent \$2.50 for a notebook, 75¢ for a marker, and \$24.99 for a backpack.

What was the total amount she spent? ________

2. There were 126 horses on a farm. After some were sold,

there were 108 horses left. How many were sold? ________

3. Two hundred forty-one people went to the amusement park on Monday morning. One hundred seventy-nine people bought lunch in the park.

How many did not buy lunch? ________

4. Joe had 6.3 feet of lumber for a woodworking project. After he bought some more wood, he had 10.9 feet.

How much did he buy? ________

5. The cafeteria used 348 hot dog buns, 429 sandwich buns, and 642 hamburger buns in one week.

How many buns were used in all? ________

Name ______________________________

• Problems About Comparing
• Elapsed Time Problems

- To solve these word problems:
  1. Look for phrases such as “How many more?” or “How many less?”.
  2. Write an equation for the given information.
  3. Solve for the unknown number.
  4. Check to see if the answer makes sense.

  Elapsed-time problems ask you to compare information about two different dates, ages, or times.

Greater, Smaller, Difference $g - s = d$	greater ← If missing, add. − smaller ← If missing, subtract. difference ← If missing, subtract.
Later, Earlier, Difference $l - e = d$	later ← If missing, add. − earlier ← If missing, subtract. difference ← If missing, subtract.

Practice:

1. Agnes worked for her employer from January 1954 to January 1999.

For how many years was Agnes employed? __________

2. The Star Newspaper sells 25,750 papers each day.
The Recorder Dispatch sells 31,250 papers daily.
How many more papers does the Dispatch distribute each day? __________

3. Edgar was born in 1990. His sister was born 12 years later.

In what year was Edgar’s sister born? __________

4. The zoo has 138 tropical birds on display.
There are 25 fewer shore birds on display.

How many shore birds are on display? __________

5. The price of a set of bedroom furniture was reduced from two thousand, sixty-four dollars to five hundred seventy-four dollars.

By how much was the price reduced? __________

• Problems About Equal Groups

- To solve these word problems, look for information about the number in each group or the total number of groups. Then write and solve an equation.

Equal Groups		
$n \times g = t$	number in each group $\times$ number of groups total	← If missing, divide. ← If missing, divide. ← If missing, multiply.

- Another helpful method is the loop method:

Example: Ted has 15 tennis balls. There are 3 tennis balls in each can. How many cans of tennis balls does he have?

1. Name the two things the problem is about: $\frac{\text{cans}}{\text{tennis balls}}$
2. Fill in what you know: $\frac{\text{cans}}{\text{tennis balls}} = \frac{1}{3}$
3. Fill in what you are looking for: $\frac{\text{cans}}{\text{tennis balls}} \quad \frac{1}{3} = \frac{?}{15}$
4. Make a diagonal loop around two known numbers and multiply the numbers inside the loop. $\frac{\text{cans}}{\text{tennis balls}} \quad \frac{1}{3} = \frac{?}{15}$
5. Divide by the outside number: $15 \div 3 = 5$
   Ted has 5 cans of tennis balls.

Practice:

1. Two hundred forty-eight cans were packed into 31 boxes. How many cans were in each box? ________

2. Harold has 75 pictures in his photo album. He has put 5 pictures on each page. How many pages did he use? ________

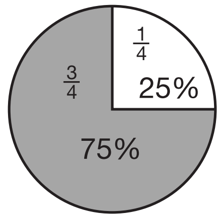
3. Students are seated in 25 rows in the auditorium. There are 13 students in each row. How many students are seated altogether? ________

Name ____________________

• Problems about Parts of a Whole
• Simple Probability

- If you know a part of a whole, you can find the remaining part of the whole.
- To solve problems about parts of a whole:
  1. Write and solve an equation.
     Example: a + b = w
  2. Subtract to find a or b.

All Students



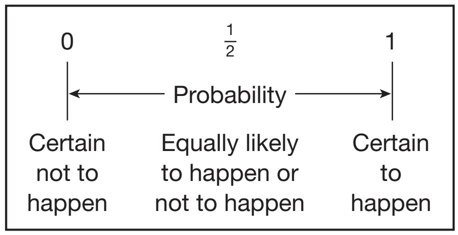
- For **percents,** the whole (w) is **100%.**
- For **fractions,** the whole (w) is **1.**

Example: If $\frac{1}{4}$ of the students attended the game, what fraction of students did not attend?

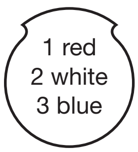
$a + b = w \longrightarrow \frac{1}{4} + b = 1$
$\longrightarrow b = 1 - \frac{1}{4} \longrightarrow b = \frac{3}{4}$

	Percent	Fraction
Part	25	$\frac{1}{4}$
Part	75	$\frac{3}{4}$
Whole	100	1

- **Probability** $= \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$



Example: What is the probability of drawing a white marble from this bag?



$\frac{\text{number of white marbles}}{\text{total number of marbles}} = \frac{2}{6}$

Reduce to lowest terms. $\frac{2}{6} = \frac{1}{3}$

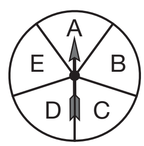
Practice:

1. Three sevenths of the cups are plastic.
What fraction of the cups are not plastic? ________

2. Forty percent of the balls in the box were white.

What percent of the balls were not white? ________

Use the spinner on the right to solve 3 and 4.



3. What is the probability that the spinner will stop on E? ________

4. What is the probability that the spinner will stop on T? ________

• Equivalent Fractions
• Reducing Fractions, Part 1

- **Equivalent fractions** have the same value. (Equivalent means "equal.")

  Form equivalent fractions by multiplying any fraction by another fraction equal to 1.

  Example: $\frac{3}{4} \times \boxed{\frac{3}{3}} = \frac{9}{12}$

  $\frac{9}{12}$ is equivalent to $\frac{3}{4}$.

- **Reduced fractions** are also called equivalent fractions.

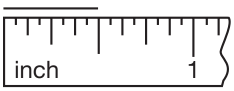
  Reduce fractions by dividing any fraction by another fraction equal to 1.

  Example: $\frac{9}{12} \div \boxed{\frac{3}{3}} = \frac{3}{4}$

  $\frac{9}{12}$ reduces to $\frac{3}{4}$.

  The *terms* of a fraction are the numbers used when writing a fraction. Reduce fractions to lowest terms by dividing the terms by the GCF. If both terms of a fraction cannot be divided by the same number, the fraction cannot be reduced. For example, the fractions $\frac{2}{5}$ and $\frac{4}{9}$ cannot be reduced because they are already in lowest terms.

  Reading a ruler requires knowing how to reduce fractions.



$\frac{8}{16}$ in. $=$ $\frac{4}{8}$ in. $=$ $\frac{2}{4}$ in. $=$ $\frac{1}{2}$ in.

Practice:

Reduce each fraction.

1. $\frac{8}{24}$ ______________

2. $\frac{5}{25}$ ______________

3. $6\frac{2}{6}$ ______________

Complete each equivalent fraction.

4. $\frac{4}{9} = \frac{?}{54}$ ______________

5. $\frac{3}{7} = \frac{15}{?}$ ______________

6. $\frac{10}{45} = \frac{?}{9}$ ______________

7. Which of the following does not equal $2\frac{1}{5}$? ________

A. $\frac{33}{15}$ **B.** $\frac{12}{5}$ **C.** $\frac{11}{5}$ **D.** $2\frac{2}{10}$

Name ______________________________

• U.S. Customary System
• Function Tables

Units of Weight

16 ounces (oz)	=	1 pound (lb)
2000 pounds	=	1 ton (t)

Units of Length

12 inches (in.)	=	1 foot (ft)
3 feet	=	1 yard (yd)
1760 yards	=	1 mile (mi)
5280 feet	=	1 mile

Units of Liquid Measure

1 c	=	8 oz	2 c	=	1 pt
1 pt	=	16 oz	2 pt	=	1 qt
			4 qt	=	1 gal

Fahrenheit Temperature Scale

212° F	—	Water boils
98.6° F	—	Normal body temperature
68° F	—	Room temperature
32° F	—	Water freezes

- A **function** is a rule that shows the relationship between two sets of numbers.

  The rule tells how to use the input numbers to get the output numbers.

  A *function table* shows pairs of related numbers.

Rule: Multiply by 6

Input	Output
1	6
2	12
3	18
5	30

Practice:

Complete each statement.

1. 1 yd = ________ in. **2.** $\frac{1}{2}$ qt = ________ pt **3.** 12 pt = ________ gal

4. Describe the rule of this function table.

____

Input	Output
1	11
2	12
3	13
7	17

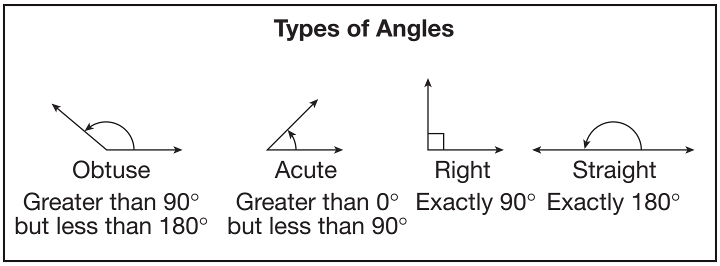
Name ____________________

• Measuring Angles with a Protractor

- Angles are measured in **degrees.** The abbreviation for degrees is a small circle above and to the right of the number.

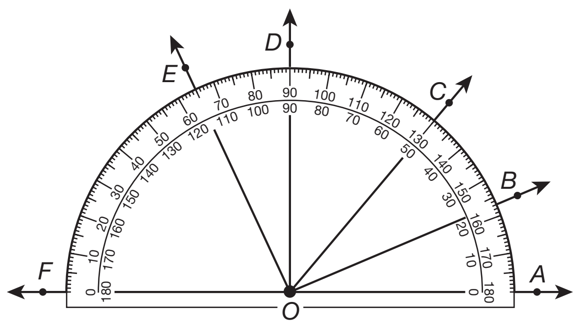
Examples:

A full circle measures 360°. A half circle measures 180°.



- A **protractor** is a tool used to measure the size of an angle.

  Place the **center point** of the protractor on the **vertex** (point) of the angle. Place one of the **zero** marks on one **ray** of the angle.
- A protractor has *two* sets of numbers. If the angle is **acute,** use the smaller number. If the angle is **obtuse,** use the larger number.



$\angle AOD$ = 90° Right Angle
$\angle AOC$ = 50° Acute Angle
$\angle AOE$ = 115° Obtuse Angle
$\angle AOF$ = 180° Straight Angle

Practice:

1. What is the measure of $\angle AOB$ in the protractor above? ________

2. How many degrees are in $\frac{1}{9}$ of a full circle? ________

3. What type of angle is a 35° angle? ________

4. Use your protractor to draw a 35° angle using the line provided below.

____

Name ________________________________

• Polygons
• Similar and Congruent

- **Polygons** are *closed, flat* shapes made from **straight** line segments.

  Two sides of a polygon meet at a **vertex.**

  The name of a polygon states its *number* of sides and angles.

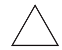
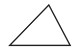
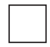
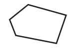
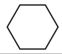
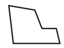
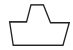
    A **quadrilateral** is a polygon with 4 sides and 4 angles.

  A **regular polygon** has congruent (equal) sides and angles.

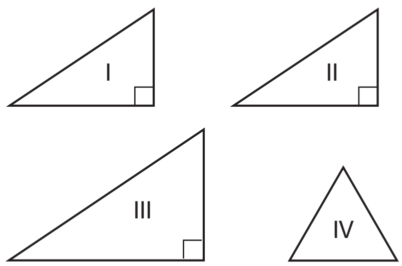
    A **square** is a *regular* polygon.

- **Similar** polygons are the same *shape* and have *corresponding angles*, but are not necessarily the same size.
- **Congruent** polygons have *corresponding* angles and sides that *match exactly*.

Common Polygons

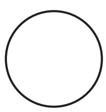
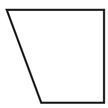
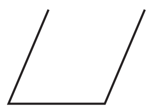
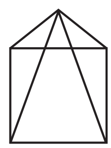
Name	Number of Sides	Regular Shape	Irregular Shape
Triangle	3		
Quadrilateral	4		
Pentagon	5		
Hexagon	6		
Octagon	8		

Examples: Triangles I, II, and III are **similar.**
Triangles I and II are **congruent.**



Practice:

1. Which of these figures is a polygon? __________

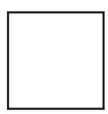
A.  **B.**  **C.**  **D.** 

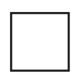
2. Based on the number of sides, what is the shape of one panel of a closet door?

____

3. Which of these polygons appear to be similar?

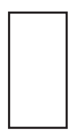
____

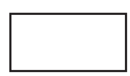

A.


B.

4. Which of these polygons appear to be congruent?

____


C.

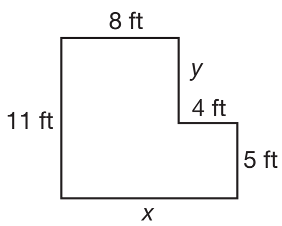

D.

Name ______________________________

• Perimeter

- **Perimeter** is the distance around a polygon.
- To find *perimeter*, add the lengths of **all** the sides.

Example: Find the perimeter of the polygon below.
If some sides are not labeled, add or subtract to find labels for these sides.
(*Hint:* It helps to use two different colors.)
Trace over all *horizontal* lines in one color.
Trace over all *vertical* lines in another color.



$x = 8 + 4 = 12$
$y = 11 - 5 = 6$
Perimeter $= 8 + 6 + 4 + 5 + 12 + 11 = 46$ ft

Practice:

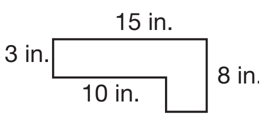
1. If one side of a square is 12 inches long, what is the perimeter? ________

2. The perimeter of a regular triangle equals the perimeter of a square. The side of the square is 24 inches long. How long is each side of the triangle?

____

3. If each side of a regular hexagon is $4\frac{1}{2}$ in., what is its perimeter? ________

Find the perimeter of each figure below.

4. 

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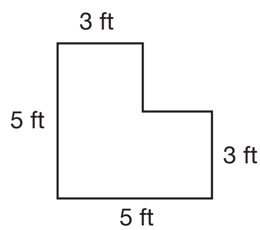
5. 

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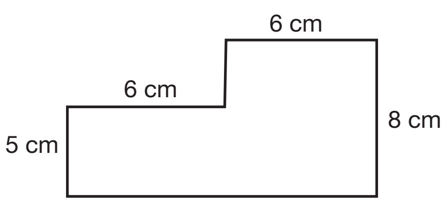
6. 

____

Name ________________________________

- **Exponents**
- **Rectangular Area, Part 1**
- **Square Root**

- An **exponent** shows repeated multiplication.
  It shows how many times the base is used as a factor.

  Example: base ⟶ 5^4 ⟵ exponent

- To calculate with exponents, write the products.

  Examples: $5^2 + 3^2 = 5 \cdot 5 + 3 \cdot 3 = 34$

  $2^3 \cdot 2^2 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 32$

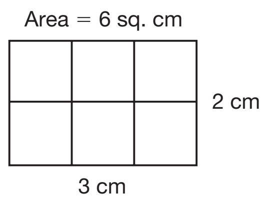
  $7^3 \div 7^2 = \frac{7 \cdot 7 \cdot 7}{7 \cdot 7} = 7$

- "Cover" is the keyword for area.

  Area = length × width

  Label area with square units.

  Example:



- To find the **square root** of a number, find the factor that was multiplied by itself.

  Square root symbol: $\sqrt{}$

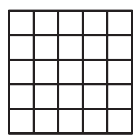
  This symbol is read as "the square root of."

  $\sqrt{25} = 5$ is read as "the square root of twenty-five equals five."

  Squaring and finding the square root are inverse operations. One operation "undoes" the other operation.

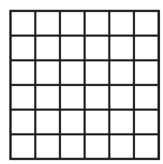
  $8^2 = 64$ and $\sqrt{64} = 8$

The square root of 25 is 5.



Each side is 5.
$5^2 = 25$ squares

The square root of 36 is 6.



Each side is 6.
$6^2 = 36$ squares

$\left(\frac{1}{4}\right)^2 = \frac{1}{4} \cdot \frac{1}{4} = \frac{1}{16}$ and $\sqrt{\frac{1}{16}} = \frac{1}{4}$

Practice:

1. A rectangle is 30 ft long and 10 ft wide. What is the area of the rectangle?

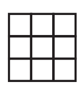
____

Simplify 2 and 3.

2. $10^2 - 2^3 - \sqrt{49}$ __________

3. $\left(\frac{9}{10}\right)^2$ __________

4. What two facts about squares and square roots does this figure illustrate?



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