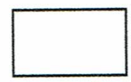
Name ______________________________

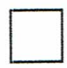
• Triangles, Rectangles, Squares, and Circles

• **Triangle** → 3 sides

Rectangle → 4 sides

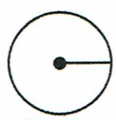


Square → a rectangle with 4 **equal** sides

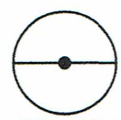


• Measures of a **circle**:

Radius $= \frac{1}{2} \times$ diameter

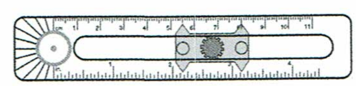

Radius

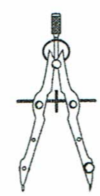
Diameter $= 2 \times$ radius


Diameter

• To draw circles, we can use a tool called a **compass**.

Here are two types of compasses:





Practice:

1. Draw a triangle with no sides that are the same length.

2. Draw a rectangle that is about three times as long as it is wide.

3. Use a compass to draw a circle with a diameter of 2 inches.

4. Draw a square that has sides 2 inches long.

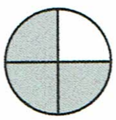
Name ______________________________

• Naming Fractions
• Adding Dollars and Cents

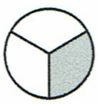
Naming Fractions

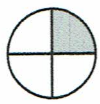
- To find the fraction of a shape that is shaded:
  1. Count the number of shaded parts. → top number
  2. Count the total number of parts. → bottom number

Example:



$\dfrac{\text{parts shaded}}{\text{total number of parts}}$ $\quad \dfrac{3}{4} \quad$ $\dfrac{\textbf{numerator}\text{ (top number)}}{\textbf{denominator}\text{ (bottom number)}}$

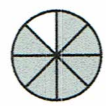
 $\frac{1}{3}$ one third

 $\frac{1}{4}$ one fourth

 $\frac{1}{10}$ one tenth

 $\frac{3}{5}$ three fifths

 $\frac{5}{6}$ five sixths

 $\frac{7}{8}$ seven eighths

Adding Dollars and Cents

- To add dollars and cents, start with pennies.

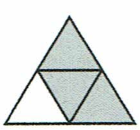
Example:
1. Add pennies.
2. Add dollars.
3. Add dollars.

```
   1 1
  $3.56   Line up the
+ $3.54   decimal points.
 ------
  $7.10
```

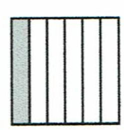
- Remember to write the dollar sign and decimal point in the sum.

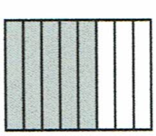
Practice:

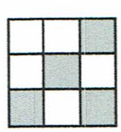
What fraction of each shape is shaded?

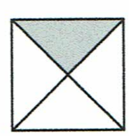
1.  ________

2.  ________

3.  ________

4.  ________

5.  ________

6.  ________

7. $1.25 + $2.68

8. $4.74 + $3.96

Name ______________________________

• Lines, Segments, Rays, and Angles

- A **line** extends in opposite directions with no end. Arrowheads show that it continues in both directions.

line

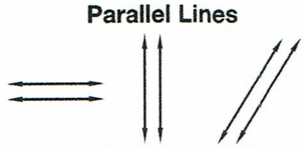
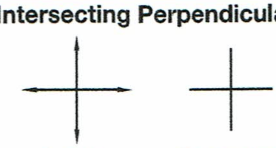
- A line **segment** is part of a line. It has **endpoints**, not arrowheads.


segment

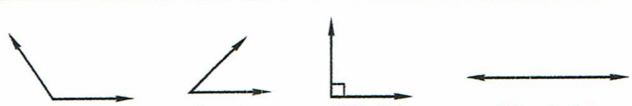
- A **ray** begins at a point and continues in one direction without end. It has one arrowhead.

ray

- **Parallel** lines or segments never cross.
- When lines or segments cross, we say they **intersect**.
- Intersecting lines or segments that form "square corners" are **perpendicular**.

Types of Lines			
Parallel Lines	**Parallel Segments**	**Intersecting Perpendicular**	**Intersecting Oblique**
			
Horizontal Vertical Oblique	Horizontal Vertical Oblique	Lines Segments	Lines Segments

- **Angles** are formed where lines or segments intersect or where two or more rays or segments begin.

Types of Angles

Obtuse **Acute** **Right** **Straight**

Practice:

1. Draw two segments that intersect and are perpendicular.

2. Draw a ray.

3. Describe something in the real world that can represent a pair of parallel lines.

____

Name ______________________

• Inverse Operations

- When we know one addition fact, we know three other facts.

Example: If we know $n + 1 = 3$

then we also know $1 + n = 3$ $\quad 3 - n = 1$ $\quad 3 - 1 = n$

- Notice that one of the facts shows us how to find the missing addend from the original problem.

$3 - 1 = n$ $\qquad$ So, $n = 2$

- Addition and subtraction are **inverse operations** because one operation "undoes" or "reverses" the other.

Practice:

Write a subtraction fact for each addition fact.

1. $\begin{array}{r} 26 \\ + \ r \\ \hline 43 \end{array}$ $\quad \begin{array}{r} 43 \\ - \ \underline{\quad} \end{array}$

2. $\begin{array}{r} m \\ + \ 15 \\ \hline 29 \end{array}$ $\quad - \ \underline{\quad}$

3. $\begin{array}{r} 39 \\ + \ z \\ \hline 63 \end{array}$ $\quad - \ \underline{\quad}$

4. $\begin{array}{r} 44 \\ + \ d \\ \hline 57 \end{array}$ $\quad - \ \underline{\quad}$

Write an addition fact for each subtraction fact.

5. $\begin{array}{r} 43 \\ - \ q \\ \hline 6 \end{array}$ $\quad \begin{array}{r} 6 \\ + \ \underline{\quad} \end{array}$

6. $\begin{array}{r} t \\ - \ 19 \\ \hline 38 \end{array}$ $\quad + \ \underline{\quad}$

7. $\begin{array}{r} 64 \\ - \ a \\ \hline 26 \end{array}$ $\quad + \ \underline{\quad}$

8. $\begin{array}{r} 17 \\ - \ w \\ \hline 3 \end{array}$ $\quad + \ \underline{\quad}$

For each number sentence, write a fact to show how to find the missing number. Then solve.

9. $23 + t = 46$

____

$t =$ ________

10. $a + 12 = 77$

____

$a =$ ________

11. $99 - y = 9$

____

$y =$ ________

Name ____________________

• Subtraction Word Problems

- Subtraction problems follow a pattern:
  "Some − Some went away = Some left"
- Another way to express the pattern is:
  "Original amount − Some part = Difference"
- If the original amount (top number) is missing, add the **difference** to the part.

Some	m apples	23		
Some went away	− 12 apples	+ 12		
Some left	23 apples	35		m = 35 apples

- If the subtracted part is missing, subtract the difference from the original amount.

Some	45 apples	45		
Some went away	− m apples	− 28		
Some left	28 apples	17		m = 17 apples

- If the difference is missing, subtract the part from the original amount.

Some	67 apples	67		
Some went away	− 34 apples	− 34		
Some left	m apples	33		m = 33 apples

Practice:

1. At the start line, 53 cyclists had water. Some cyclists dropped their bottles during the race. At the finish, only 28 cyclists had bottles. How many cyclists dropped bottles?

53	had bottles		
− w	dropped bottles	− ____	
28	now have bottles	w =	________ dropped bottles

2. A flock of geese started flying north. Then 55 geese landed at a pond. Now 28 geese are flying together. How many geese were flying north before some landed?

y	geese started		
− 55	landed	____	
28	now flying	y =	________ geese started

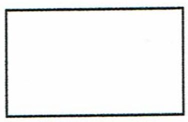
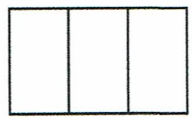
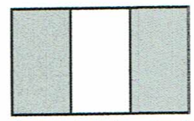
3. Thom had \$40. He spent \$24. Then how much money did Thom have?

Name ____________________________________

• Drawing Pictures of Fractions

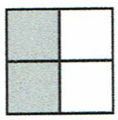
- To draw a picture of a fraction:
  1. Draw the figure.
  2. Divide into **equal parts**.
  3. Shade the correct number of parts.

Examples:

$\frac{2}{3}$ →  →  → 

Rectangle | 3 equal parts | 2 parts shaded

Other examples:

 $\frac{1}{2}$

 $\frac{1}{3}$

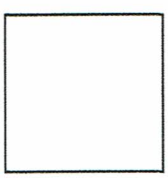
 $\frac{1}{4}$

- To divide a circle into equal **thirds**:
  1. Draw a dot in the center. 
  2. Make a "Y" from the dot. 

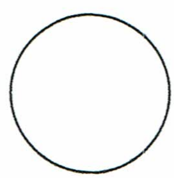
These are not equal parts: 

Practice:

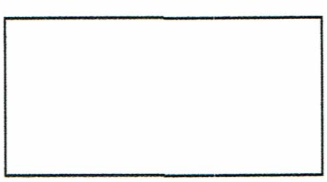
1. Shade one fourth of the square.



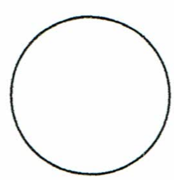
2. Shade two thirds of the circle.



3. Shade two fifths of the rectangle.



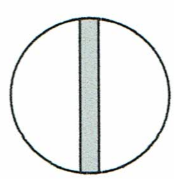
4. Shade three fourths of the circle.



5. Is one fifth of this circle shaded? __________

Why or why not? ______________________

____



• Multiplication as Repeated Addition
• More Elapsed-Time Problems

Multiplication as Repeated Addition

- Multiplication can represent the addition of identical numbers.

Example: $5 + 5 + 5 + 5 + 5 + 5 = 6 \times 5$

Elapsed Time

- Picture a clock face divided into 4 equal parts. Each part represents 15 minutes.
- The difference between a time on the clock and the time directly across from it is always 30 minutes.
- Every **twelve hours** is the same hour—only the a.m. or p.m. will change.
- Every **twenty-four hours** is the same time of day, but it is the next day of the week.

Practice:

Write the following repeated addition problems as multiplication problems.

1. $2 + 2 + 2 + 2 + 2 + 2 + 2 =$ ________

2. $8 + 8 + 8 + 8 =$ ________

Write the following multiplication problems as repeated addition problems.

3. 6×3 ____________ **4.** 4×5 ____________ **5.** 3×8 ____________

Look at a clock or use a student clock to answer problems 6–7. Remember to write "a.m." or " p.m."

6. If it is morning, what time will it be in 3 hours and 45 minutes?

Start time: 10:45

Count forward 45 minutes. ________________

Count forward 3 hours. ________________

7. If it is evening, what time was it 7 hours and 15 minutes ago?

Start time: 8:15

Count backward 15 minutes. ________________

Count backward 7 hours. ________________

• Multiplication Table

- Numbers we multiply together are called **factors**. The answer to a multiplication problem is called a **product**.
- A multiplication table shows the products of different pairs of factors.
- To use the multiplication table to find a product, we first find one factor in a row. Then we find the other in a column. The product is the number where the row and column meet.
- The **Commutative Property of Multiplication** states that changing the order of factors does not change the product.

  $a \times b = b \times a$
- The **Property of Zero for Multiplication** states that any number times zero equals zero.

  $a \times 0 = 0$
- The **Identity Property of Multiplication** states that any number times one equals the number.

  $a \times 1 = a$

Properties of Multiplication

Commutative Property	$m \times n = n \times m$
Identity Property	$1 \times n = n$
Zero Property	$0 \times n = 0$

Practice:

Use the multiplication table to find each product.

1. 9×6 **2.** 6×9 **3.** 8×4 **4.** 4×8

5. 7×8 **6.** 8×7 **7.** 5×9 **8.** 9×5

Name ______________________

• Multiplication Facts (0s, 1s, 2s, 5s)

- Zero $\times$ any number $=$ 0. (Property of Zero for Multiplication)
- One $\times$ any number $=$ the same number. (Identity Property of Multiplication)
- Two $\times$ any number $=$ double the number.
- Five $\times$ any number $=$ a number that ends in 0 or in 5.

Practice:

Complete the multiplication facts below.

1. $5 \times 3 =$ ______	**2.** $8 \times 2 =$ ______	**3.** $0 \times 4 =$ ______
4. $1 \times 7 =$ ______	**5.** $7 \times 5 =$ ______	**6.** $3 \times 2 =$ ______
7. $1 \times 5 =$ ______	**8.** $4 \times 1 =$ ______	**9.** $6 \times 2 =$ ______
10. $5 \times 4 =$ ______	**11.** $9 \times 5 =$ ______	**12.** $2 \times 2 =$ ______
13. $6 \times 1 =$ ______	**14.** $3 \times 4 =$ ______	**15.** $5 \times 0 =$ ______
16. $0 \times 7 =$ ______	**17.** $5 \times 6 =$ ______	**18.** $2 \times 7 =$ ______
19. $5 \times 5 =$ ______	**20.** $1 \times 2 =$ ______	**21.** $2 \times 5 =$ ______

Name ______________________________

• Subtracting Three-Digit Numbers with Regrouping

- Work from right to left.
- When the digit in the top number is smaller than the digit in the bottom number, we regroup from the next place to the left.
- When regrouping, it helps to cross-out the digit and rewrite the new number above the column.
- When subtracting dollars and cents, remember to line up the decimal points and to write the dollar sign in money problems.

Example:

$$\begin{array}{r} {\scriptstyle 0\ 17} \\ \$5.\cancel{1}\cancel{7} \\ -\ \$3.28 \\ \hline 9 \end{array} \rightarrow \begin{array}{r} {\scriptstyle 4\ 10\ 17} \\ \$\cancel{5}.\cancel{1}\cancel{7} \\ -\ \$3.28 \\ \hline .89 \end{array} \rightarrow \begin{array}{r} {\scriptstyle 4\ 10\ 17} \\ \$\cancel{5}.\cancel{1}\cancel{7} \\ -\ \$3.28 \\ \hline \$1.89 \end{array}$$

$$\rightarrow \begin{array}{r} {\scriptstyle 3\ 13} \\ \$6.\cancel{4}\cancel{3} \\ -\ \$4.56 \\ \hline 7 \end{array} \rightarrow \begin{array}{r} {\scriptstyle 5\ 13\ 13} \\ \$\cancel{6}.\cancel{4}\cancel{3} \\ -\ \$4.56 \\ \hline .87 \end{array} \rightarrow \begin{array}{r} {\scriptstyle 5\ 13\ 13} \\ \$\cancel{6}.\cancel{4}\cancel{3} \\ -\ \$4.56 \\ \hline \$1.87 \end{array}$$

Practice:

Subtract. Remember to write the dollar sign in money problems.

1. $\begin{array}{r} \$451 \\ -\ \$277 \\ \hline \end{array}$

2. $\begin{array}{r} \$6.74 \\ -\ \$4.75 \\ \hline \end{array}$

3. $\begin{array}{r} 583 \\ -\ 396 \\ \hline \end{array}$

4. $\begin{array}{r} 340 \\ -\ 157 \\ \hline \end{array}$

5. $\begin{array}{r} 449 \\ -\ 299 \\ \hline \end{array}$

6. $\begin{array}{r} 982 \\ -\ 695 \\ \hline \end{array}$

Name ______________________________

• Area Models

- An array is a rectangular arrangement of numbers or symbols in columns and rows.

5 columns

4 rows

X X X X X
X X X X X
X X X X X
X X X X X

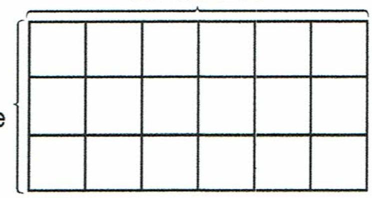
This array shows that 4 times 5 equals 20. It also shows that 4 and 5 are both factors of 20.

- An area model is an array of connected squares.

  This model shows that $6 \times 3 = 18$.

6 squares on this side

3 squares on this side

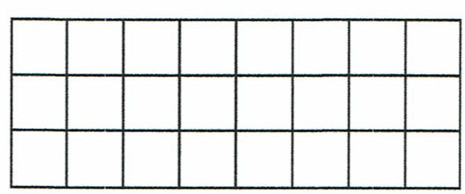


- **Area** of a shape is measured by counting the number of squares of a certain size that are needed to cover a surface.
- A square is a rectangle whose length and width are equal. We say that we "square a number" when we multiply by a number by itself.
- The numbers 1, 4, 9, 16, 25, 36, and so on form a sequence of **square numbers,** or **perfect squares.**
- To find a **square root** of a number, we find a number that, when multiplied by itself, equals the original number. The square root of a number is indicated using the square root symbol $\sqrt{}$.

  For example, "the square root of twenty-five equals five" or $\sqrt{25} = 5$.

Practice:

1. Draw a 6 column by 3 row array of Xs. What multiplication fact is represented by the array?
2. Draw an array of 15 Xs arranged in 5 rows. Then write the multiplication fact.
3. Draw an area model of 3×4. How many small squares are in the rectangle? _____
4. What is the multiplication fact that is illustrated by this rectangle?



Find each square root.

5. $\sqrt{36}$ 6. $\sqrt{81}$ 7. $\sqrt{100}$

