


ENTERING 8TH GRADE MATH

HARRIS/DAWSON



**Summer
MATH**

Ratios

Ratios are comparisons of two quantities.
There are 3 different ways to write ratios:

- Fraction $\left(\frac{A}{B}\right)$
- Colon (A:B)
- Word Form (A to B)

ex: write the ratio of triangles to circles
in 3 ways: $\triangle \triangle \triangle \triangle \bigcirc \bigcirc$

$$\frac{4}{2} = \boxed{\frac{2}{1}, 2:1, 2 \text{ to } 1}$$

Ratios can be simplified just like fractions.

Rates & Unit Rates

Rates are ratios that compare quantities measured in different units.
A unit rate is a rate with a denominator of 1.

ex: express as a unit rate:
125 miles in 4 hours

To convert a rate to a unit rate:

1. Divide the numerator by the denominator
2. Either write your answer as a fraction with a label for the both the numerator and denominator OR as one number labeled with the first unit "per" the second unit

$$\frac{125 \text{ mi}}{4 \text{ hr}} \quad 125 \div 4 = 31.25$$

$$\boxed{\frac{31.25 \text{ mi}}{1 \text{ hr}} \text{ or } 31.25 \text{ miles per hr}}$$

Fractions, Decimals, & Percent

To convert a:

- Decimal to Percent: move the decimal point 2 places to the right
- Percent to Decimal: move the decimal point 2 places to the left
- Decimal to Fraction: write the decimal over the place value of the last digit and then simplify
- Fraction to Decimal: divide the numerator by the denominator
- Percent to Fraction: write the percent over 100 and then simplify
- Fraction to Percent: convert the fraction to a decimal and then convert the decimal to a percent

ex: $0.345 = \boxed{34.5\%}$

ex: $7\% = \boxed{0.07}$

ex: $0.008 = \frac{8}{1000} = \boxed{\frac{1}{125}}$

ex: $\frac{1}{5} = 5 \overline{)1.0} = \boxed{0.2}$

ex: $45\% = \frac{45}{100} = \boxed{\frac{9}{20}}$

ex: $\frac{3}{10} = 0.3 = \boxed{30\%}$

Percent of a Number

1. Turn the percent to a fraction or decimal.
2. Multiply the fraction/decimal by the number.

ex: Find 18% of 40

$$0.18 \cdot 40 = \boxed{7.2}$$

Write each ratio in 3 ways.

<p>A bank contains 15 pennies and 12 nickels. Write the ratio of nickels to pennies.</p>	<p>A bowl contains 6 apples and some bananas. If there are a total of 10 pieces of fruit, find the ratio of apples to bananas.</p>
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Convert each rate to a unit rate.

<p>\$4.25 for 64 fluid ounces</p>	<p>297 miles on 11 gallons of gas</p>	<p>124 feet in 10 seconds</p>
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Complete the chart by converting each number to a percent, fraction, and/or decimal.

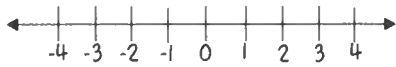
Fraction	Decimal	Percent
$\frac{3}{8}$		
	0.45	
		72%
	0.1	
$\frac{3}{200}$		

Find each percent of a number.

<p>30% of 90</p>	<p>15% of 38</p>	<p>50% of 86</p>
<p>75% of 160</p>	<p>24% of 35</p>	<p>2% of 74</p>

Comparing Integers

Integers are numbers without fractional parts. They can be positive, negative, or zero. The further right a number is on the number line, the greater it is.



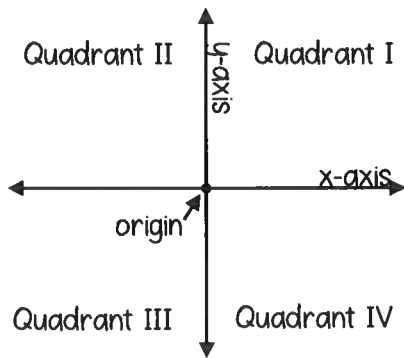
The absolute value of a number is the distance the number is from zero.

ex: compare with $<$, $>$, or $=$

-7 ○ $| -9 |$ ← The absolute value of $-9 = 9$

-7 □ $<$ 9

The Coordinate Plane

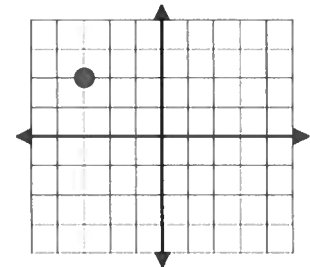


Ordered Pair: (x, y)

To graph a point on the coordinate plane, start at the origin. The first number in the ordered pair (the x-coordinate) tells you how far left (if negative) or right (if positive) to move. The second number (the y-coordinate) tells you how far up (if positive) or down (if negative) to move.

ex: Graph the point $(-3, 2)$ and state the quadrant in which it is located.

Start at the origin, and move LEFT 3 and UP 2

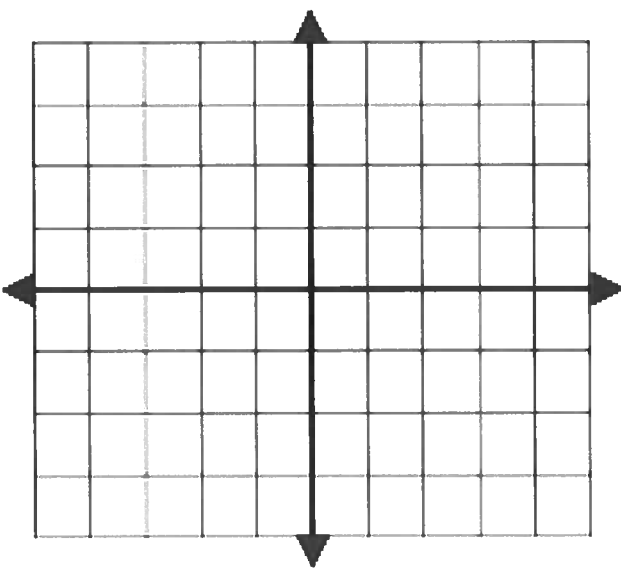


Quadrant II

Compare the integers with $<$, $>$, or $=$.

$-4 \bigcirc -5$	$2 \bigcirc -2$	$ -5 \bigcirc 5 $	$-7 \bigcirc 6$	$-13 \bigcirc -9$
$ -7 \bigcirc -6$	$-17 \bigcirc -14$	$ -3 \bigcirc -2 $	$0 \bigcirc -6$	$ -4 \bigcirc 6 $

Graph and label each of the ordered pairs in the coordinate plane. Then state the quadrant or axis in/on which the point is located.

A(2, 4)	B(0, -3)	
C(1, -1)	D(3, 3)	
E(-4, 1)	F(2, 0)	
G(-3, -2)	H(-2, 3)	
I(0, 2)	J(-1, -4)	

One-Step Addition & Subtraction Equations

- Addition Equations: Subtract the number being added to the variable from both sides of the equation

$$\begin{array}{r} \text{ex: } 4 + x = 18 \\ -4 \qquad -4 \\ \hline x = 14 \end{array}$$

- Subtraction Equations: Add the number being subtracted from the variable to both sides of the equation

$$\begin{array}{r} \text{ex: } 20 = a - 5 \\ +5 \qquad +5 \\ \hline 25 = a \rightarrow a = 25 \end{array}$$

One-Step Multiplication & Division Equations

- Multiplication Equations: Divide both sides of the equation by the number next to the variable

$$\begin{array}{r} \text{ex: } 7b = 28 \\ \cancel{7} \qquad \cancel{7} \\ \hline b = 4 \end{array}$$

- Division Equations: Multiply both sides of the equation by the number under the variable

$$\begin{array}{r} \text{ex: } 5 \cdot \frac{n}{5} = 10 \cdot 5 \\ \cancel{5} \qquad \cancel{5} \\ \hline n = 50 \end{array}$$

Problem Solving

1. Read the problem. Identify the question that is being asked and the key information in the problem.
2. Plan how you are going to solve the problem and estimate the answer.
3. Solve the problem using the strategy of your choice.
4. Check your answer. Make sure your answer is reasonable and compare it to your estimate. Label your answer with appropriate units.

Solve each one-step equation.

$$g + 3 = 17$$

$$r - 6 = 7$$

$$6b = 18$$

$$\frac{h}{q} = 3$$

$$5 = f - 8$$

$$48 = 12b$$

$$a + 24 = 83$$

$$17 + x = 23$$

GRAPHING INEQUALITIES

Directions: Graph each inequality. Find your answer in one of the three columns. Find each problem number on the coloring page and color each occurrence of that number with the color that corresponds to your answer.

#	Inequality	Graph Options		
1	$x \geq 4$	 Yellow	 Green	 Black
2	$x < 6$	 Purple	 Orange	 White
3	$x \leq -2$	 Yellow	 Red	 Orange
4	$x > 0$	 Black	 Green	 Red
5	$\frac{1}{2} \leq x$	 Pink	 Blue	 Yellow
6	$x \leq -2\frac{1}{2}$	 Orange	 Yellow	 Red
7	$-8 > x$	 Blue	 Purple	 Black
8	$x \leq 9\frac{1}{2}$	 Black	 Brown	 Pink
9	$x \geq -1$	 Purple	 Blue	 Orange
10	$-3 < x$	 Black	 White	 Brown

