

STAAR Category 2

15 questions on STAAR

7.3(B) apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers	7.3(A) add, subtract, multiply, and divide rational numbers fluently
7.4(A) represent constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including $d = rt$	7.4(B) calculate unit rates from rates in mathematical and real-world problems
7.4(D) solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems	7.4(C) determine the constant of proportionality ($k = y/x$) within mathematical and real-world problems
7.7(A) represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y = mx + b$	7.10(A) write one-variable, two-step equations and inequalities to represent constraints or conditions within problems
7.11(A) model and solve one-variable, two-step equations and inequalities	7.10(B) represent solutions for one-variable, two-step equations and inequalities on number lines
	7.10(C) write a corresponding real-world problem given a one-variable, two-step equation or inequality
	7.11(B) determine if the given value(s) make(s) one-variable, two-step equations and inequalities true

- When you have to write an equation or solve a problem, use your highlighter for important info. Write + - x ÷ over words that mean that.

REMINDERS: When you multiply by a percent, you must change to a decimal first.

Adding Fractions

the original fractions: $\frac{1}{3} + \frac{1}{2}$

with a common denominator: $\frac{2}{6} + \frac{3}{6}$

result: $\frac{5}{6}$

Subtracting Fractions with Borrowing

$$\begin{array}{r} 4\frac{2}{3} \\ -2\frac{3}{4} \\ \hline \end{array} \rightarrow \begin{array}{r} 4\frac{8}{12} \\ -2\frac{9}{12} \\ \hline \end{array} \rightarrow \begin{array}{r} \cancel{4}3 + 1\frac{8}{12} \\ -2\frac{9}{12} \\ \hline \end{array} \rightarrow \begin{array}{r} 3\frac{20}{12} \\ -2\frac{9}{12} \\ \hline 1\frac{11}{12} \end{array}$$

Multiplying Fractions

$$\frac{1}{2} \times \frac{20}{18} = \frac{20}{36}$$

GCF: 4

$$\frac{20}{36} \div 4 = \frac{5}{9}$$

Dividing Fractions

$$5\frac{5}{6} \div 2\frac{1}{10} = \frac{35}{6} \div \frac{21}{10} = \frac{35}{6} * \frac{10}{21} = \frac{25}{9} = 2\frac{7}{9}$$

$\frac{1}{2}$	÷	$\frac{1}{6}$
leave me	change me	turn me over
$\frac{1}{2}$	×	$\frac{6}{1}$

- **Setting up Proportions:** Make sure you have your numbers in the correct spot. Write a **word ratio** first to help. Ex. $\frac{\text{width}}{\text{length}}$

Example Problem 1.

- ❖ Leslie wanted to make a poster from a picture she took of her friends. The picture had a width to length ratio of 4:5. Which of the following can be used to find the width of the poster if she wants the length to be 40 inches?

a. $\frac{4}{5} = \frac{40}{x}$

b. $\frac{4}{9} = \frac{x}{40}$

c. $\frac{5}{4} = \frac{x}{100}$

d. $\frac{4}{5} = \frac{x}{40}$

Example Problem 2. Percent Proportion:

$$\frac{\text{part}}{\text{whole}} = \frac{\%}{100}$$

- ❖ A bag of skittles contains 14% green, 35% red, 18% yellow, 24% purple, and 9% orange skittles. Sidney put 350 skittles in a jar. Which proportion can be used to find g , the total number of green skittles that you would expect to find in the jar?

a. $\frac{350}{g} = \frac{14}{100}$

b. $\frac{14}{350} = \frac{g}{100}$

c. $\frac{g}{350} = \frac{14}{100}$

d. $\frac{g}{14} = \frac{100}{350}$

➤ Percent Increase/Percent Decrease:

$$\text{Percent increase} = \frac{\text{increase}}{\text{original value}} (100)$$

$$\text{percent decrease} = \frac{\text{decrease}}{\text{original value}} (100)$$

Example: Last year, you could buy a flat screen TV for \$800. This year, the same TV sells for \$950. What is the percent increase for the cost of the TV?

18.75%

➤ Solving Equations and Inequalities: Isolate the variable **DO THE OPPOSITE**

One-Step: $-12 + z = -36$

±

$z = -24$

One-Step Ex. 2

Multiply By
Reciprocal

$$14 = -\frac{7}{3}a$$

$$a = -6$$

One-Step Ex. 3

$$14x = 35$$

$$x = 2.5$$

One-Step Ex. 4

$$\frac{x}{13} = -7$$

$$x = -91$$

Two-Step: $19 = 3y - 5$

\pm

\div or \times

$y = 8$

Two-Step Example 2: $\frac{2}{7}x + 4 = 36$

$x = 112$

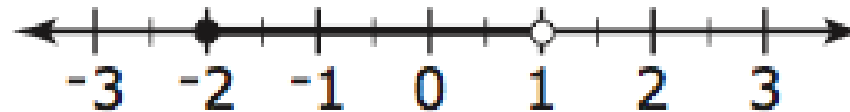
When solving inequalities, solve the same as normal,
but if you multiply or divide by a negative--- **FLIP THE SIGN**

FLIP THE SIGN

$-4x + 7 \geq 31$

Don't have to Flip the sign

$3x - 4.5 < 22.5$



Which inequality matches this number line?

A $-2 < x \leq 1$

B $-2 \leq x \leq 1$

C $-2 \leq x < 1$

D $-2 < x < 1$

• means \leq \geq

Greater than or equal to
Or Less than or equal to

o means $<$ $>$ (point not included)

>>Getting an equation from a table or a graph.

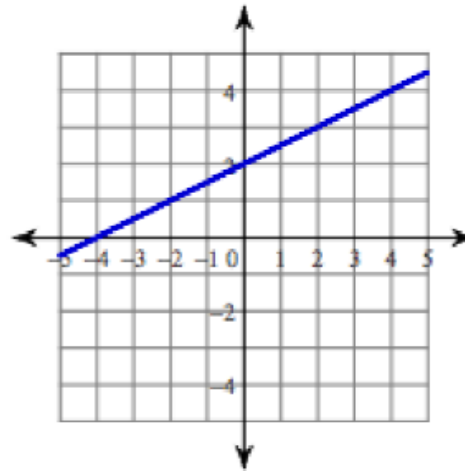
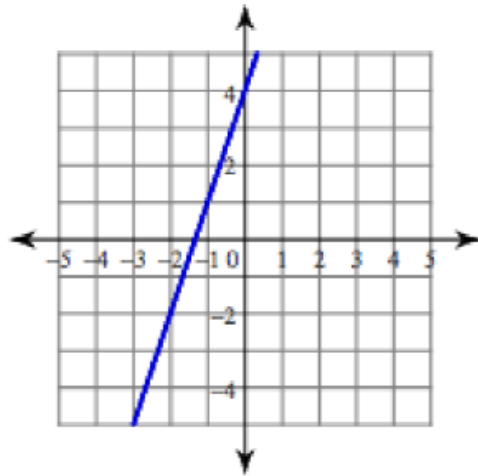
$$y = m x \pm b$$

b, Y-INTERCEPT
GRAPH: CROSSES Y-AXIS
TABLE: WHERE X = 0

SLOPE: $\frac{\text{rise}}{\text{run}}$, rate of change, unit rate

m, SLOPE IS A
STAIRSTEP

Example Problem 1a and 1b.



Example Problem 2:

- ❖ Write an equation to represent the relationship between x and y in the table below.
(hint: FIND SLOPE $\frac{\text{CHANGE IN } Y}{\text{CHANGE IN } X}$ AND y -intercept, where $x = 0$)

X	Y
8	6
12	8
16	10
20	12
22	13


A. $y = -2x - 2$


B. $y = \frac{1}{2}x$

C. $y = \frac{1}{2}x + 4$

D. $y = \frac{1}{2}x + 2$

Remember:

Positive Slope goes UP 

Negative Slope goes DOWN 

Constant of Proportionality:

$$k = \frac{y}{x} \text{ where } k = \text{a constant}$$

Example 2: Blake tutors math for \$28 per hour.

$Y = 28x$ The constant of proportionality is 28.

Example:

X	Y
2	12
4	24
6	36
8	48

The table shows a constant of proportionality.

The constant, $(k) = 6$ or

Compute $\frac{y}{x}$ on all to see if it is proportional