

Review for Mid-Term



Fractions:

$$\frac{6}{15} + \frac{3}{15} = \frac{9}{15}$$

$$\frac{8}{9} - \frac{2 \cdot 3}{3 \cdot 3} =$$

LCM=9

$$\frac{8}{9} - \frac{6}{9} = \frac{2}{9}$$

Students:

$$(1) \quad \frac{2}{\underline{12}} - \frac{1}{\underline{12}} = \frac{1}{12}$$

$$(2) \quad \frac{3}{\underline{6}} + \frac{9}{\underline{6}} = \frac{12}{6} = 2$$

$$\begin{array}{l} \rightarrow \\ \rightarrow \end{array} \frac{3}{4} \times \frac{1}{2} = \frac{3}{8}$$

$$\begin{array}{l} \rightarrow \\ \rightarrow \end{array} \frac{2}{4} \times \frac{3}{2} = \frac{\cancel{2}}{\cancel{4}} \frac{3}{\cancel{2}} = \frac{3}{2}$$

Students:

$$(3) \begin{array}{l} \rightarrow \\ \rightarrow \end{array} \frac{2}{6} \times \frac{4}{3} = \frac{\cancel{8}}{\cancel{18}} \frac{4}{9}$$

Write as a percent.

0.34 34%

Students:

(4) Write as a percent.

0.73

What is an algebraic expression for the word phase?

4 times the sum of x and 7 $4(x+7)$ ✓

Students: What is an algebraic expression for the word phase?

(5) 2 times the sum of x and y

$$2(x+y)$$

Number of Books	Height (cm)	
2	$\times 9$	18
3	$\times 9$	27
4	$\times 9$	36
n	$\times 9$?

$$n \cdot 9 = h \checkmark$$

$$9n = h \checkmark$$

(6) ~~Students: The table shows how the height of a stack of books depends on the number of books. What is a rule for the height?~~

Order of Operations: PEMDAS

What is the simplified form of each expression?

$$3 + (2 - 1) = 3 + 1 = 4$$

$$2^2 + 3 = 4 + 3 = 7$$

$$2^2 = 2 \cdot 2$$

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

Students: What is the simplified form of each expression?

$$(7) \quad 4(2 - 3)^2 - 3 = 4(-1)^2 - 3$$
$$4(1) - 3 = 4 - 3 = 1$$

$$(-1)(-1) = 1$$

$$(8) \quad 3(15 - 5) \div 2$$
$$3(10) \div 2$$
$$30 \div 2 = 15$$

Evaluate $(x + y)$ for $x = 3$ and $y = 4$

$$(3 + 4) = 7$$

Students:

(9) Evaluate (xy) for $x = 4$ and $y = 8$

$$(4 \cdot 8) = 32$$

Students:

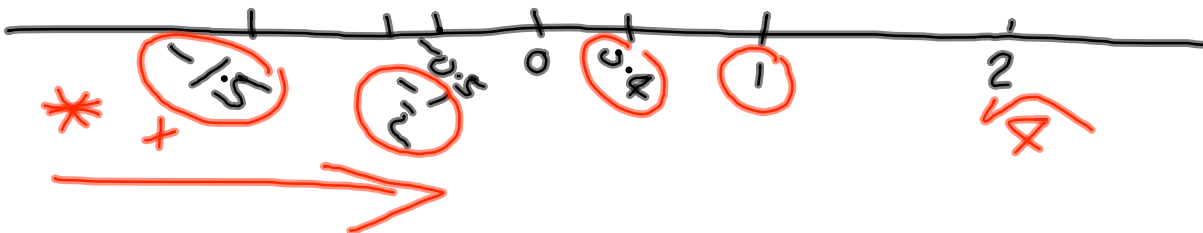
(10) What is the square root of 50 to the nearest integer?

$$\sqrt{50} = 7.07 \approx 7$$

Students: (11) What is the order of

$\sqrt{4}$, 0.4, $-\frac{1}{2}$, 1, -1.5 from least to greatest?

~~2~~, ~~0.4~~, -0.5, ~~1~~, -1.5



Properties of Real Numbers:

Commutative Property of Addition and Multiplication.
order

$$\underline{18} + \underline{54} = \underline{54} + \underline{18}$$

$$2 \cdot 3 = 3 \cdot 2$$

Associative Property of Addition and Multiplication.

grouping (parentheses)

$$\underline{(23 + 9)} + \underline{4} = \underline{23} + \underline{(9 + 4)}$$

Students: (12) What property is illustrated by each statement?

$$8 + (3 + 5) = (8 + 3) + 5$$

Associative

Students:

(13) What is the sum? $-4 + 2 = -2$ ✓

(14) What is the Sum? $-3.4 + 3.5 = 0.1$ ✓

What is the simplified form of each expression?

$$3(3m + 5) = 3(3m) + 3(5) = 9m + 15$$

$$-(3x + 3y) = -1(3x) + -1(3y) = -3x - 3y$$

$$\begin{aligned} \rightarrow \frac{1}{3} \frac{(21x + 27)}{1} &= \frac{21x + 27}{3} & \frac{21x}{3} + \frac{27}{3} &= 7x + 9 \end{aligned}$$

Students:

What is the simplified form of each expression?

$$(15) \frac{1}{4} (8x + 16) \rightarrow \frac{1}{4} \frac{(8x+16)}{1} \quad \frac{8x+16}{4} = \frac{8x}{4} + \frac{16}{4}$$

$$2x + 4$$

$$(16) -1(4x - 5y) = -1(4x) + -1(-5y)$$

$$-4x + 5y$$

Students:

(17) Is $(2, 4)$ a solution of the equation $y = 2x$

$$4 = 2 \cdot 2$$

$$4 = 4 \quad \checkmark$$

What is the solution of the equation?

$$\begin{array}{r} x - 4 = -2 \\ +4 \quad +4 \\ \hline x = 2 \end{array}$$

$$\begin{array}{r} 5x + 3 = 23 \\ -3 \quad -3 \\ \hline 5x = 20 \\ \frac{5x}{5} = \frac{20}{5} \quad x = 4 \end{array}$$

$$\begin{array}{r} -5 \quad x - 3 \\ \hline -5 \end{array} = -15 \quad (-5)$$

$$\begin{array}{r} x - 3 = 75 \\ +3 \quad +3 \\ \hline x = 78 \end{array}$$

Students: What is the solution of the equation?

$$(18) \quad \begin{array}{r} w - 4 = -5 \\ \quad \quad \quad \color{red}{+4} \quad \color{red}{+4} \\ \hline \color{red}{w = -1} \end{array}$$

$$\color{green}{-1 - 4 = -5}$$

$$(19) \quad \begin{array}{r} 3.6x + 2.6 = 10.6 \\ \quad \quad \quad \color{green}{-2.6} \quad \color{green}{-2.6} \\ \hline \color{green}{3.6x = 8} \\ \color{red}{\frac{3.6x}{3.6} = \frac{8}{3.6}} \end{array}$$

$$\dots \quad \color{red}{x = 2.2}$$

$$(20) \quad \begin{array}{r} \color{green}{\cancel{2} \cdot x - 4 = 2 \cdot 2} \\ \quad \quad \quad \color{green}{+4} \quad \color{green}{+4} \\ \hline \color{blue}{x = 8} \end{array}$$

Students: What is the solution of the equation?

$$(21) \quad 4x + \underline{3} + \underline{2} = 25$$

$$4x + \cancel{3} = 25$$

$$\quad \quad \quad \underline{-3} \quad \quad \underline{-3}$$

$$\underline{4x = 20}$$

$$\underline{\quad 4} \quad \quad \underline{\quad 4}$$

$$x = 5$$

$$(22) \quad \overset{\vee}{5}t - \overset{\neq}{3} = \overset{\vee}{2}t - \overset{\neq}{6}$$

$$\quad \underline{-2t} \quad \quad \underline{-2t}$$

$$\underline{3t - 3 = -6}$$

$$\quad \quad \underline{+3} \quad \quad \underline{+3}$$

$$\underline{3t = -3}$$

$$\underline{\quad 3} \quad \quad \underline{\quad 3}$$

$$t = -1$$

$$(23) \quad 3 + 6s = 13 + 6s$$

(23)

$$\overset{\#}{3} + \overset{\checkmark}{\cancel{6S}} = \overset{\#}{13} + \overset{\checkmark}{\cancel{6S}}$$

$$3 = 13$$

What equation do you get when you solve

$$\textcircled{ax} + b = c \text{ for } x$$

$$\frac{\cancel{ax}}{\cancel{a}} = \frac{c-b}{a} \quad x = \frac{c-b}{a}$$

Students:

(24) What equation do you get when you solve

$$a - y = a + sx \text{ for } x$$

$$\frac{-y}{s} = \frac{\cancel{sx}}{\cancel{s}}$$

$$\frac{-y}{s} = x$$

Unit Rate: A rate with a denominator of 1 unit is a unit rate.

You are shopping for t-shirt. Which store offers the best deal?

Store A: \$25 for 2 shirts Store B: \$45 for 4 shirts
Store C: \$30 for 3 shirts

$$\frac{25}{2} = \frac{x}{1}$$

$$\frac{25}{2} = \frac{2x}{2}$$

$$x = 12.5$$

$$\frac{45}{4} = \frac{x}{1}$$

$$\frac{45}{4} = \frac{4x}{4}$$

$$x = 11.25$$

$$\frac{30}{3} = \frac{x}{1}$$

$$\frac{30}{3} = \frac{3x}{3}$$

$$x = 10$$

Students: (24) A car factory makes 50 cars in 5 hours. What is the average rate at which cars are made per hour?

$$\frac{50}{5} = \frac{x}{1}$$

$$50 = 5x$$

Part 2:

You are shopping for apples. Publix sells 3 apples for \$3.00. Farmers market sells 4 apples for \$3.50. Walgreens sells 1 apple for \$1.25. Which store has the best deal?

$$\frac{\$3}{3} \times \frac{x}{1}$$

$$3 = 3x$$

$$x = 1$$

$$\frac{3.50}{4} \times \frac{x}{1}$$

$$\frac{1.25}{1} \times \frac{x}{1}$$

What is the given amount converted to the given units?

132ft; inches

$$\begin{array}{r}
 132\cancel{\text{ft}} \\
 \hline
 1
 \end{array}
 \cdot
 \begin{array}{r}
 12\cancel{\text{in}} \\
 \hline
 1\cancel{\text{ft}}
 \end{array}$$

$12\text{in} = 1\text{ft}$

Proportion: Like with Like

$$\frac{5}{2} \neq \frac{10}{x}$$

$$\frac{5x}{5} = \frac{20}{5}$$

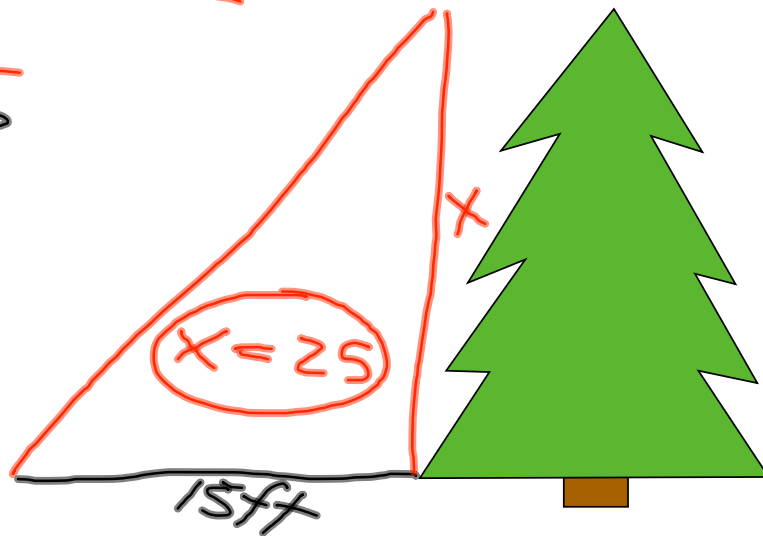
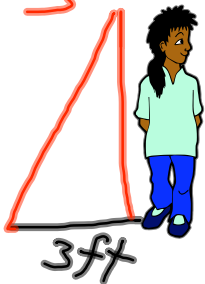
$$x = 4$$

Students:

A tree cast a shadow 15ft long. A girl standing next to the tree casts a shadow 3ft long. The triangle shown for the tree and its shadow is similar to the triangle shown for the girl and her shadow. If the girl is 5ft. tall, how tall is the tree?

$$\frac{5}{3} \neq \frac{x}{15}$$

$$\frac{3x}{3} = \frac{75}{3}$$



Percent: What percent of 160 is 120?

$$\frac{IS}{OF} = \frac{\%}{100} \quad \frac{120}{160} \times \frac{X}{100}$$

$$\frac{12000}{160} = \frac{100X}{100}$$
$$X = 75$$

A T-shirt that costs \$39.50 is on sale for 45% off.
What is the sale price of the T-shirt?

$$\underline{45\% \text{ of } \$39.50} \quad \frac{\text{IS}}{\text{OF}} = \frac{\%}{100}$$

If the sale tax is 3%, what is the cost of a pair of gloves with a price of \$15?

3% of \$15

Interest in the Bank:

$$I = Prt$$

r = rate written as a decimal

$$5\% \quad 0.05$$

$$10\% \quad 0.1$$

$$1.5\% \quad .015$$

I deposited \$600 dollars in a savings account that earns a simple interest rate of 2.5% per year. I want to keep the money in the account for 6 years. How much interest will I earn?

$$I = Prt$$

$$P = 600$$

$$r = .025$$

$$t = 6$$

Students: *old = original*

Percent increase

&

Percent decrease

$$\text{increase} = \frac{\text{new} - \text{old}}{\text{old}}$$

$$\text{decrease} = \frac{\text{old} - \text{new}}{\text{old}}$$

Anna is currently making \$36,000 a year at her job and has been offered a raise to \$41,000 per year. What would be the percent increase in her salary?

$$\frac{41,000 - 36,000}{36,000}$$

~~All real numbers greater than or equal to 76~~

$$x \geq 76$$

Graph $d < 4$



Graph $x \leq -5$

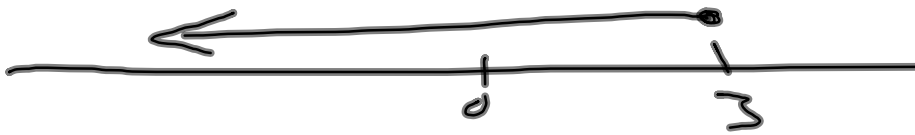


The Spanish Club is sponsoring a bake sale. If their goal is to raise at least \$140, how many pastries must they sell at 3.50 each in order to meet that goal? Write and solve an inequality. Circle your answer.

- (a) $3.50p \geq 140$; $p \geq 490$
- (b) $140p \geq 3.50$; $p \geq 40$
- (c) $3.50p \geq 140$; $p > 136.5$
- (d) $3.50p \geq 140$; $p \geq 40$

What are the solutions of the inequality? Graph the solution.

$$\frac{-3x}{-3} \geq \frac{-9}{-3}$$
$$x \leq 3$$



What are all the subsets of the set? $\{-2, 6\}$

$\{-2\}, \{6\}, \{\}, \{-2, 6\}$

Suppose $U = \{-9, -6, -4, -2, 0, 2, 4\}$ is the universal set and T is the set $\{-9, -4, 0, 2\}$. What is the complement of set T ?

(leftovers)

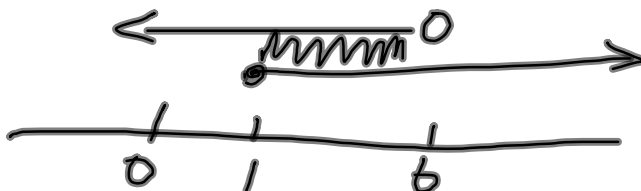
$$\{-6, -2, 4\}$$

What are the solutions of the compound inequality? Graph the solutions.

$$\begin{array}{ccc} -4 \leq 4x - 8 < 16 \\ +8 & +8 & +8 \end{array}$$

$$\frac{4}{4} \leq \frac{4x}{4} < \frac{24}{4}$$

$$1 \leq x < 6$$



(50) $4x - 4 < -12$ or $2x + 3 > 7$

