

Name _____

Mrs. Roubos

Date _____

8A Period _____

Extra Review for the Midterm

<p>1) Factor the following expressions completely.</p> <p>A) $x^2 + 2x - 8$ B) $36x^2 - 49$</p> <p>C) $3x^2 - 300$?</p>	<p>2) Which property is being used to solve the following equation?</p> $8(x + 4) - 16 = 24x - 8$ $8(x + 4) = 24x + 8$
<p>3) Solve the following equation for y.</p> $6(by + 5) = 19$	<p>4) The equation for the volume of a cylinder is $V = \pi r^2 h$. The positive value of r, in terms of h and V, is?</p>
<p>5) Simplify: $(x - 3)(x^2 + 2x - 4)$</p> <p>b) Simplify: $(x - 3)^2$</p>	<p>6) What is the equation of a line in point-slope form with a slope of 8 that passes through the point $(-4, 1)$?</p>
<p>7) Write an equation with <u>1 variable</u> to find the number of each coin Sam has. <u>DO NOT SOLVE</u>. Sam has 2 more pennies than quarters. He has a total of \$1.32.</p>	<p>8) The length of a rectangle is 2 less than three times the width. Find the dimensions if the perimeter is 28cm?</p>

9) Determine the smallest integer that makes $-3x + 7 - 5x < 15$ true.

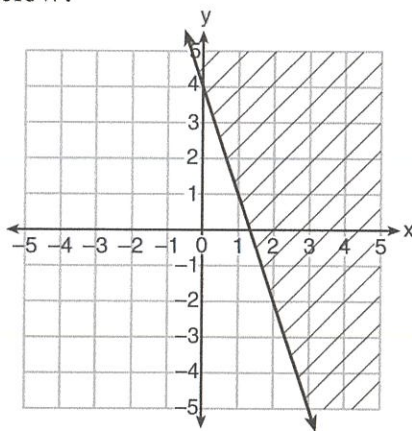
10) Express in simplest form:
 $(3x^2 + 4x - 8) - (-2x^2 + 4x + 2)$

11) If you multiply your answer to #10 by $\frac{1}{2}x^2$ what is the result in standard form?

12) Which statement is *not* always true?

- A) The product of two irrational numbers is irrational.
- B) The product of two rational numbers is rational.
- C) The sum of two rational numbers is rational.
- D) The sum of a rational number and an irrational number is irrational.

13) Which inequality is represented in the graph below?



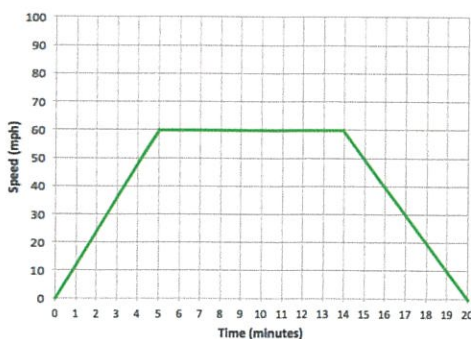
- A) $y \geq -3x + 4$
- B) $y \leq -3x + 4$
- C) $y \geq -4x - 3$
- D) $y \leq -4x - 3$

14) Amy joins a gym. Her monthly plan will charge her \$10 per month and an additional \$5 for each spin class she takes.

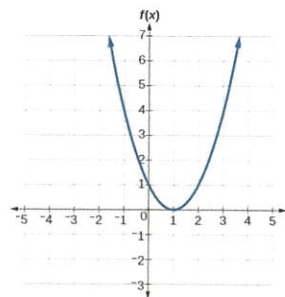
- A) What a function which describes her monthly cost, c , as a function of spin classes, s .
- B) Using the function you wrote, what would her bill be for a month that she attends 4 spin classes?

15) Describe what could be happening between 5 & 14 minutes.

Driving a car



16) Is the following a function?



17) A company produces x units of a product per month, where $C(x)$ represents the total cost and $R(x)$ represents the total revenue for the month. The functions are modeled by $C(x) = 300x + 250$ and $R(x) = 400x + 50$. Use the equation $300x + 250 = 400x + 50$ to determine the value of x , that will make the cost and revenue the same.

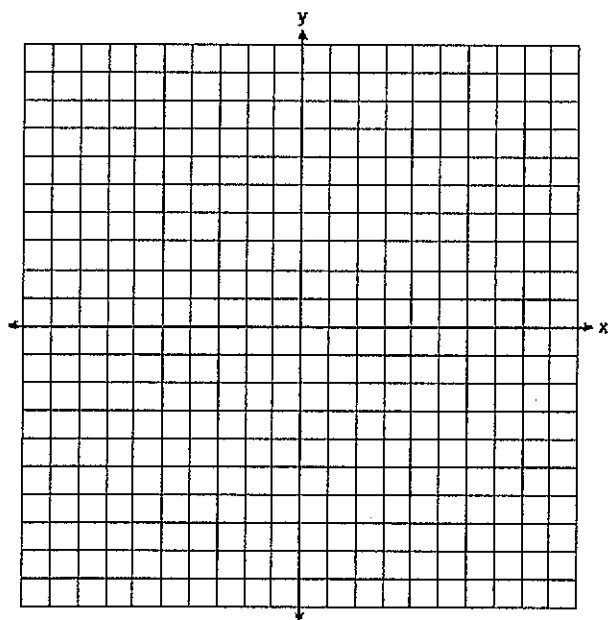
18) Solve for x .

$$\frac{x-4}{10} + \frac{3}{10} = \frac{6}{12}$$

19) Graph the following systems of inequalities on the set of axes below. State a point in the solution set.

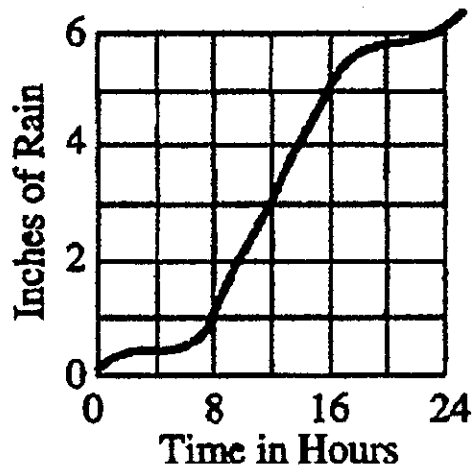
$$2y \geq 3x - 16$$

$$y + 2x > -5$$



20) Jacob and Zachary go to the movie theater and purchase refreshments for their friends. Jacob spends a total of \$18.25 on two bags of popcorn and three drinks. Zachary spends a total of \$27.50 for four bags of popcorn and two drinks. Write a system of equations and then use these equations to determine the price of a bag of popcorn and the price of a drink.

21) What is the average rate of change from 8 hours to 16 hours?



steps
find 2 #'s that multiply to -8 and add to 2.
Extra Review for the Midterm

1) Factor the following expressions completely.

A) $x^2 + 2x - 8$ → Trinomial with no common factors
 $(x+4)(x-2)$

B) $36x^2 - 49$ → DOPS b/c it's a binomial
 $(6x+7)(6x-7)$ with subtractive conjugates to taking √'s

C) $3x^2 - 300$? Completely

$3(x^2 - 100)$
 $3(x+10)(x-10)$

2) Which property is being used to solve the following equation?

$$8(x+4) - 16 = 24x - 8$$

$$8(x+4) = 24x + 8$$

Addition Property of Equality

3) Solve the following equation for y.

$$6(by+5) = 19$$

$$6by + 30 = 19$$

$$\frac{6by}{6b} = \frac{-11}{6b}$$

$$y = -\frac{11}{6b}$$

4) The equation for the volume of a cylinder is $V = \pi r^2 h$. The positive value of r in terms of h and V , is?

$$V = \pi r^2 h$$

$$\frac{V}{\pi h} = \frac{\pi r^2 h}{\pi h}$$

$$\sqrt{r^2} = \sqrt{\frac{V}{\pi h}}$$

$$r = \sqrt{\frac{V}{\pi h}}$$

5) Simplify: $(x-3)(x^2+2x-4)$ Distribute

$$x^3 + 2x^2 - 4x - 3x^2 - 6x + 12$$

$$x^3 - x^2 - 10x + 12$$

6) What is the equation of a line in point-slope form with a slope of 8 that passes through the point $(-4, 1)$?

$$y - y_1 = m(x - x_1)$$

$$y - 1 = 8(x + 4)$$

* Don't forget to switch the signs of the coordinates

b) Simplify: $(x-3)^2$ $(x-3)(x-3)$

$$x^2 - 3x - 3x + 9$$

$$x^2 - 6x + 9$$

7) Write an equation with 1 variable to find the number of each coin Sam has. DO NOT SOLVE. Sam has 2 more pennies than quarters. He has a total of \$1.32.

let x = the # of quarters
 $x+2$ = the # of pennies

$$.25(x) + .01(x+2) = 1.32$$

$.25(x)$ = the total value of the quarters
 $.01(x+2)$ = the total value of the pennies

8) The length of a rectangle is 2 less than three times the width. Find the dimensions if the perimeter is 28 cm?

L	W	S
let x = the length of the rectangle	$x = 3y - 2$ $2x + 2y = 28$ $2x + 2y = 28$ $2(3y - 2) + 2y = 28$ $6y - 4 + 2y = 28$ $8y - 4 = 28$ $+4 +4$ $8y = 32$ $\frac{8}{8} \frac{32}{8}$ $y = 4$	The length of the rectangle is 10 cm + the width of the rectangle is 14 cm
y = the width of the rectangle	$x = 3y - 2$ $x = 3(4) - 2$ $x = 12 - 2$ $x = 10$	

Check #1
 $3(4) = 12$
 $12 - 2 = 10$

Check #2
 $2(10) = 20$
 $2(4) = 8$
 $20 + 8 = 28$ ✓

9) Determine the smallest integer that makes $-3x + 7 - 5x < 15$ true.

$-8x + 7 < 15$
 $-7 -7$
 $-8x < 8$
 $-8 -8$
 $x > -1$

* switch the direction of the symbol when dividing by a negative #

* 0 is the smallest possible integer greater than -1

10) Express in simplest form:
 $(3x^2 + 4x - 8) - (-2x^2 + 4x + 2)$

$3x^2 + 4x - 8 + 2x^2 - 4x - 2$

$5x^2 - 10$

* Distribute the negative sign

11) If you multiply your answer to #10 by $\frac{1}{2}x^2$ what is the result in standard form?

$\frac{1}{2}x^2(5x^2 - 10)$

$\frac{5}{2}x^4 - 5x^2$

Distribute, Add the exponents

or $2.5x^4$ or $2\frac{1}{2}x^4$

12) Which statement is not always true?

A) The product of two irrational numbers is irrational. Ex $\sqrt{\frac{3}{2}} \cdot \sqrt{2} = \sqrt{3}$ $\sqrt{9} = 3$

B) The product of two rational numbers is rational.

C) The sum of two rational numbers is rational.

D) The sum of a rational number and an irrational number is irrational.

13) Which inequality is represented in the graph below?

$m = \frac{\text{rise}}{\text{run}}$
 $m = -\frac{3}{1}$
 $m = -3$
 $B = 4$
 - solid
 - shade above \geq

A) $y \geq -3x + 4$ B) $y \leq -3x + 4$
 C) $y \geq -4x - 3$ D) $y \leq -4x - 3$

14) Amy joins a gym. Her monthly plan will charge her \$10 per month and an additional \$5 for each spin class she takes.

$b = y\text{-intercept}$ $m = \text{slope}$

A) What a function which describes her monthly cost, c , as a function of spin classes, s .

$C = 5s + 10$ or $C(s) = 5s + 10$

B) Using the function you wrote, what would her bill be for a month that she attends 4 classes?

$C(s) = 5s + 10$
 $C(4) = 5(4) + 10$
 $C(4) = 20 + 10$
 $C(4) = 30$

$\$30$

15) Describe what could be happening between 5 & 14 minutes.

Driving a car

Between 5 + 14 minutes, the car is traveling at a constant speed/rate

16) Is the following a function?

It passes the vertical line test

Explanation: Yes B/C each element of the domain corresponds to one and only one element of the range.

17) A company produces x units of a product per month, where $C(x)$ represents the total cost and $R(x)$ represents the total revenue for the month. The functions are modeled by $C(x) = 300x + 250$ and $R(x) = 400x + 50$. Use the equation $300x + 250 = 400x + 50$ to determine the value of x , that will make the cost and revenue the same.

$$\begin{array}{r} 300x + 250 = 400x + 50 \\ -300x \quad -300x \\ \hline 250 = 100x + 50 \\ -50 \quad -50 \\ \hline 200 = 100x \\ \frac{200}{100} = \frac{100x}{100} \\ \boxed{x=2} \quad \boxed{2 \text{ units}} \end{array}$$

18) Solve for x .

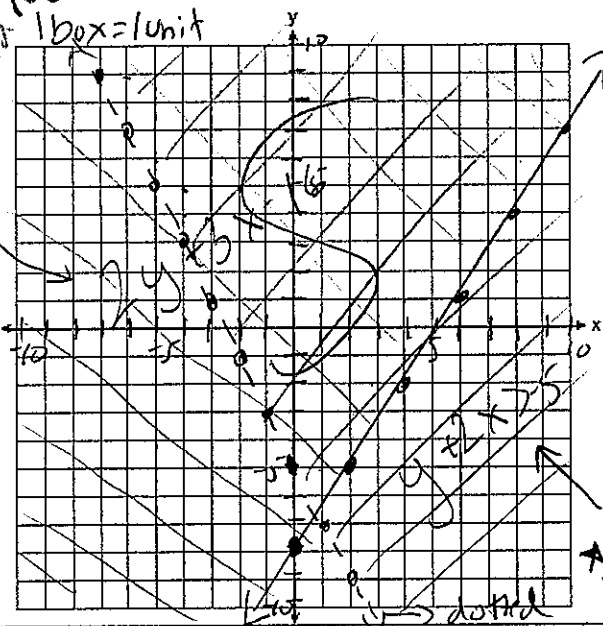
$$\begin{array}{l} \frac{x-4}{10} + \frac{3}{10} = \frac{6}{12} \\ \frac{x-4}{10} = \frac{3}{10} \\ \frac{x-4}{10} = \frac{1}{5} \quad \text{OR } \left(\frac{x-4}{10}\right) \cdot \frac{1}{5} \\ 5(x-4) = 10 \\ 5x - 20 = 10 \\ +20 \quad +20 \\ \hline 5x = 30 \\ \frac{5x}{5} = \frac{30}{5} \\ \boxed{x=6} \end{array}$$

19) Graph the following systems of inequalities on the set of axes below. State a point in the solution set. \rightarrow state for both inequalities + it's inside the intersection of the shaded region

$$2y \geq 3x - 16$$

$$y + 2x > -5$$

original inequality must be inside shaded region



$(0,0)$

Answers may vary

$$2y \geq 3x - 16$$

$$y \geq \frac{3}{2}x - 8$$

$$m: \frac{3}{2} \nearrow$$

$$b: -8$$

solid

shade above y int

$$y + 2x > -5$$

$$y > -2x - 5$$

$$m: -2 \searrow$$

$$b: -5$$

dotted

shade above y int

original inside shaded region

20) Jacob and Zachary go to the movie theater and purchase refreshments for their friends. Jacob spends a total of \$18.25 on two bags of popcorn and three drinks. Zachary spends a total of \$27.50 for four bags of popcorn and two drinks. Write a system of equations and then use these equations to determine the price of a bag of popcorn and the price of a drink.

let
 x = the price of 1 bag of popcorn
 y = the price of 1 drink

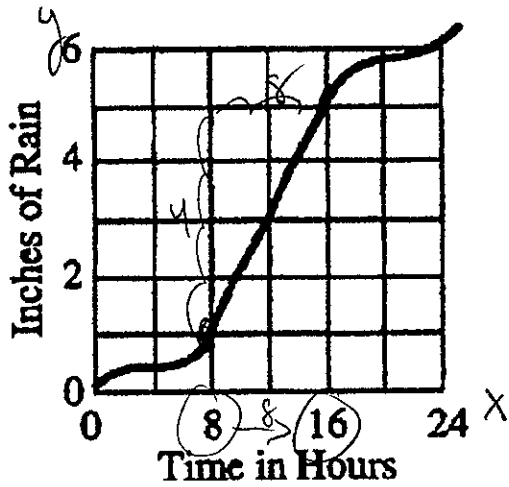
$$\begin{array}{l} 4(2x + 3y = 18.25) \rightarrow 8x + 12y = 73 \\ -2(4x + 2y = 27.50) \rightarrow -8x - 4y = -55 \\ \hline 8y = 18 \\ \frac{8y}{8} = \frac{18}{8} \\ y = 2.25 \end{array}$$

The price of 1 bag of popcorn is \$5.75 + the price of 1 drink is \$2.25

$$\begin{array}{l} 2(5.75) = 11.50 \\ 3(2.25) = 6.75 \\ \hline 18.25 \checkmark \\ 4(5.75) = 23 \\ 2(2.25) = 4.50 \\ \hline 27.50 \checkmark \end{array}$$

$$x = 5.75$$

21) What is the average rate of change from 8 hours to 16 hours? means slope $\frac{\Delta y}{\Delta x}$



Slope: $m = \frac{\text{rise}}{\text{run}}$
 $m = \frac{4}{8}$

Slope = $\frac{1}{2}$

↑
Correct,
the x-values
go up by 4's
per box

Remember:

Statement: "The sum of two rational numbers is rational."

Statement: "The product of two rational numbers is rational."

Statement: "The sum of two irrational numbers is **SOMETIMES** irrational."

Statement: "The product of two irrational numbers is **SOMETIMES** irrational."

Statement: "The sum of a rational number and an irrational number is irrational."

Statement: "The product of a rational number and an irrational number is **SOMETIMES** irrational."

