CCGPS Coordinate Algebra Unit 1 Relationships Among Quantities

Name: _____ Date: _____

Unit 1 Test Review

Solving Equations and Inequalities:

Solve the following equations:

1. $15x - 24 - 4x = -79$

$11x - 24 = -79$

$+24 \quad +24$

$\frac{11x}{11} = \frac{-55}{11}$

$x = -5$

2. $\frac{102}{-5x} = \frac{56}{-5x} - \frac{x}{12}$

$-12 \cdot 46 = -\frac{x}{12} \cdot -12$

$-552 = x$

3. $3(2x - 5) - 4x = 33$

$6x - 15 - 4x = 33$

$2x - 15 = 33$

$+15 \quad +15$

$\frac{2x}{2} = \frac{48}{2}$

$x = 24$

4. $3x - 25 = 11x - 5 + 2x$

$3x - 25 = 13x - 5$

$-3x \quad -3x$

$-25 = 10x - 5$

$+5 \quad +5$

$\frac{-20}{10} = \frac{10x}{10}$

$-2 = x$

Solve each inequality. Then check your solution.

5. $3x - 9 \leq 2x + 6$

$-2x \quad -2x$

$x - 9 \leq 6$

$+9 \quad +9$

$x \leq 15$

6. $3(r - 2) < 2r + 4$

$3r - 6 < 2r + 4$

$-2r \quad -2r$

$r - 6 < 4$

$+6 \quad +6$

$r < 10$

7. $-5x + 12 < 37$

$-12 \quad -12$

$\frac{-5x}{-5} < \frac{25}{-5}$ ← flip

$x > -5$

Define a variable, write an inequality, and solve each problem. Then check your solution.

8. A number decreased by -4 is at least 9.

$x - -4 \geq 9$

$x + 4 \geq 9$

$-4 \quad -4$

$x \geq 5$

9. Three times a number is less than twice the number added to 8.

$3x < 2x + 8$

$-2x \quad -2x$

$x < 8$

Short Answer. Show all of your work, including the equations.

10. For the expression $12x^2 + 15x + 10$, list any coefficients, or constants, and state the number of terms.

Coeff: 12, 15 Constants: 10 Terms: 3 (trinomial)

11. April is moving apartments. Her family needs to rent a UHaul truck to transport their furniture. The rental company charges $19.99 for the truck. Then, they charge $0.20 per mile. Write an equation that represents how much it will cost to use the truck where x = the miles driven. How much will it cost if the family drives it 40 miles? If they end up spending $34.99, how far did they have to drive?

(1) $19.99 + .20(40)$

$27.99

(2) $19.99 + .2x = 34.99$

$-19.99 \quad -19.99$

$\frac{.2x}{.2} = \frac{15}{.2}$

x = 75 miles

12. You need a plumber to come to your house. Pete charges $50 to come your house and $75 per hour he is there. Paul charges $75 to come to your house and $50 for each hour he is there. Write an equation to represent the charges for both plumbers. Who is cheaper for 3 hours worth of work? Pete: $50 + 75(3)$ Paul: $75 + 50(3)$

$275 $225

Paul is cheaper

13. Jennifer is buying 10 boxes Girl Scout cookies at x dollars apiece. Shipping is $8. Write an expression to represent this situation.

$10x + 8$

14. Dequan and some friends went to play mini golf. Their total cost was $40.29, which included taxes of $4.29. Each game cost 4 dollars. Write an algebraic expression to equation represent the price of each mini golf game, not including taxes. (Let x represent the number of mini golf games they all played.)

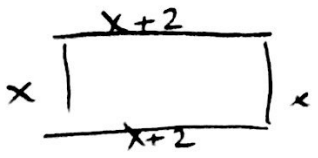
$4x + 4.29 = 40.29$

$-4.29 \quad -4.29$

$\frac{4x}{4} = \frac{36}{4}$

x = 9

15. Bill is building a sand box for his son to play in. The length is 2 feet more than the width. He used 20 feet of boards to build the walls of the sandbox. What are the dimensions of his sand box?



$4x + 4 = 20$

$-4 \quad -4$

$\frac{4x}{4} = \frac{16}{4}$

x = 4

width = 4

length = 6

16. Mary is going to the store to get some ice cream for her party. Her mom gave her $15 to spend. She wants to get a combination of ice cream sandwiches at $3 per box and gallons of Breyers ice cream at $5 each.

a) Write an equation in standard form to model this situation where s is the number of boxes of sandwiches, and b is the gallons of Breyers.

$3s + 5b = 15$

b) Solve the equation in terms of b, the number of gallons of Breyers ice cream.

$-3s + 5b = 15$, $-3s \quad -3s$

$5b = -3s + 15$

$b = \frac{-3s+15}{5}$

c) If she buys 3 boxes of sandwiches, how many gallons of Breyers can she get?

$3(3) + 5b = 15$

$9 + 5b = 15$, $-9 \quad -9$

$\frac{5b}{5} = \frac{6}{5}$

$b = 1.2$

Solve the formula for the indicated variable. Show all of your work.

17. For **r**: $V = \pi r h$

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

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

18. For **y**: $7x + 14y = -21$, $-7x \quad -7x$

$\frac{14y}{14} = \frac{-7x-21}{14}$

$y = \frac{-7x-21}{14}$

19. For **h**: $V = \frac{1}{3}Ah$ · 3

$3V = Ah$

$\frac{3V}{A} = \frac{Ah}{A}$

$\frac{3V}{A} = h$

Unit Conversions. Round to 3 decimal places.

- There are 5280 feet in one mile
- There are 0.034 ounces in one milliliter
- There are 0.454 kg in one pound
- There are 1.6 kilometers in one mile
- There are 73 gallons in 2 barrels
- There are 1.05 quarts in one liter
- There are 4 quarts in one gallon
- There are 16 ounces in a pound.

20. Convert 90 pounds to ounces.

$\frac{90 \text{ lbs}}{1} \cdot \frac{16 \text{ oz}}{1 \text{ lbs}} = 1440 \text{ oz}$

21. Convert 10 kilometers to miles.

$\frac{10 \text{ km}}{1} \cdot \frac{1 \text{ m}}{1.6 \text{ km}} = 6.25 \text{ miles}$

22. Convert 100 barrels to quarts.

$\frac{100 \text{ bar}}{1} \cdot \frac{73 \text{ gal}}{2 \text{ bar}} \cdot \frac{4 \text{ qts}}{1 \text{ gal}} = 14{,}600 \text{ qts}$

23. Convert from 0.37 miles to: a) feet, b) inches, c) meters, and d) kilometers.

$\frac{.37 \text{ miles}}{1} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}} = 19{,}53.6 \text{ ft}$ 23443.2 in

24. How long does a car traveling at 70 mph take to travel 230 miles, in hours?

$\frac{230 \text{ miles}}{70} = 3.286 \text{ hrs}$