

Math 100
Midterm Exam

Name _____
Section _____ Date _____ Score _____

Show all work for full credit!

1. Given the set $\left\{-1, 0, \frac{1}{4}, 1, 11.6, \sqrt{7}, 3\pi\right\}$, list the numbers in this set that belong to the following:

a. set of irrational numbers.

2 points

b. set of whole numbers

2 points

2. Simplify the expression.

$$\frac{6(-2)^2 + 2(3-8)}{1 + 2 \cdot 3 - \sqrt{36}}$$

5 points

3. Identify the property illustrated.

a) $8+0=8$

2 points

b) $6(8+5)=6 \cdot 8+6 \cdot 5$

2 points

4. Solve $\frac{3x-1}{4} + \frac{x+3}{6} = 3$

4 points

5. a) Solve: $4(x-5) = 5x - (x-20)$

4 points

b) Classify the equation in a) as a conditional, an identity or a contradiction.

1 point

6. Let $A = \{1,2,3,4,5,6\}$ $B = \{4,6,8\}$ $C = \{8, 9\}$

a. Find $B \cup C$

 2 points

b. Find $A \cap C$

 2 points

c. Find $A \cap B$

 2 points

7. Solve this equation for a : $3a + 10 = 6c$

 3 points

8. Write an equation or inequality that represents the problem, then solve: (4 points)

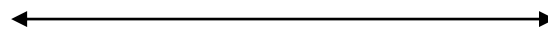
When 2 is added to two-thirds of a number the result is 7 less than the number.

Equation/inequality: _____

Solution: _____

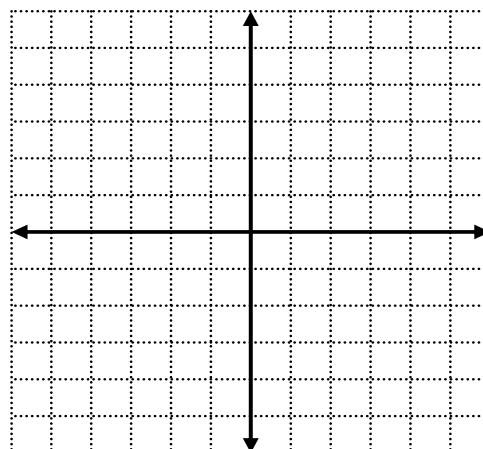
9. Solve the compound inequality. Graph and give the solution set in **interval notation**. (4 points)

$$1 - 2x > 7 \text{ and } 8 + 3x \geq -10$$



10. Find the x-intercept and the y-intercept for the equation $4x + 3y = -12$. State each intercept as an ordered pair. Graph the equation. (5 points)

x-intercept: _____ y-intercept: _____



11. a. Find the slope of the line through $(-6, 5)$ and $(-4, -1)$ if it exists.

3 points

b. Write the equation of the line in slope-intercept form.

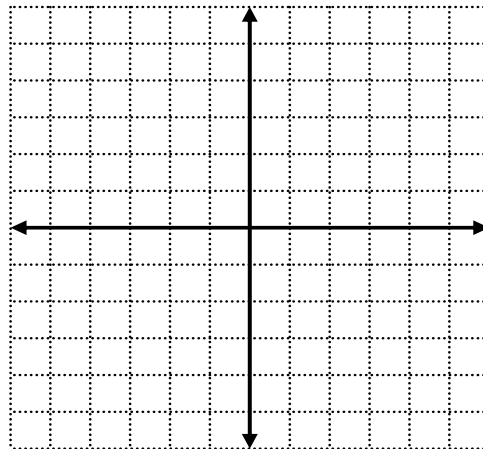
3 points

c. Find the midpoint of the segment with the above endpoints.

3 points

12. Find the slope of the line and use the slope to sketch the graph. (5 points)

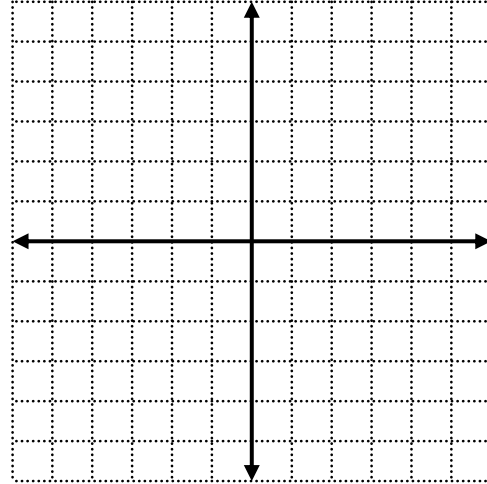
$$x + 2y = -4$$



13. Find an equation in slope-intercept form of the line perpendicular to $3x - y = 6$ and passing through the point $(2, -4)$.

5 points

14. Graph the inequality $2x - 5y < -10$ (5 points)



15. Determine whether the relation is a **function or not a function. Explain.** (3 points)

$\{(3, 4), (1, 2), (3, 7)\}$ _____

Domain: _____
1 point

Range: _____
1 point

16. Let $f(x) = -2x + 3$ and $g(x) = -x^2 + 4x + 1$ Find the following:

a. $g(-4)$ _____
2 points

b. $f(a-4)$ _____
2 points

17. Solve the system by **substitution**. Write your answer as an ordered pair.

$$x + 4y = 13$$

$$3x - 2y = 18$$

5 points

18. Solve the system by **elimination**. Write your answer as an ordered pair.

$$3x - 2y = 0$$

$$9x + 8y = 7$$

5 points

19. Write and solve a system of equations to answer the following.

A souvenir stand sold 42 t-shirts in one day. All short sleeve shirts cost \$12 each and all long sleeve shirts cost \$18 each. If \$612 was the total amount collected from the sale of the t-shirts, find the number of each type of t-shirt sold. (6 points total)

Number of short sleeve t-shirts sold _____

Number of long sleeve t-shirts sold _____

20. Complete the following statements:

a. The sum of two negative numbers is _____
1 point

b. The slope of a horizontal line is _____
2 points

c. The domain of $y = \sqrt{x+5}$ is _____
2 points

d. Write $-5 < x \leq 3$ in interval notation. _____
2 points