Name and section: _____

Instructor's name: _____

- **Please do not open exam until instructed to begin.**

- This exam is to be completed in the allotted time period of 2 hours.

- There are 20 problems which appear on the fronts and backs of the pages of this exam.

- You may earn a total of 100 points.

- Read each question carefully.

- Credit may not be given without sufficient supporting work.

- Simplify answers when possible.

- The use of cell phones, books, or notes are not permitted while taking this exam.

- Approved calculators are allowed.

1. [5 points] A rectangle has a length of 12 inches and an area of 72 square inches. Find the **width** <u>and</u> the **perimeter** of the rectangle. Be sure to include the correct units in each answer.

2. [5 points] Simplify $-2[4x^2 - (5x^2 - 3y)]$.

3. [5 points] Solve for m. Simplify answers.

$$92m + 12 - 62m = 50 - 16m$$

4. [4 points] Solve the following equation for y.

$$\frac{1}{3}(y - 12) = \frac{1}{6}y + 4$$

5. [5 points] Write the following verbal statement in algebraic form. "x minus 47 equals three times the quantity of six times x plus 5"

6. [5 points] An athlete's average time for all six track meets was 21.8 seconds. The athlete was unable to find their time in the last meet, but knew all of the other times: 21.7 seconds, 21.6 seconds, 22 seconds, 22.1 seconds, 21.9 seconds. What was her running time for her last meet?

7. [5 points] Solve and graph on the number line.

$$\frac{4}{5}x + 2 \leq \frac{3}{10}x$$

8. [5 points] Graph the line with a slope $\dfrac{-3}{4}$ that passes through the point $(-1, 2)$. Label your axes and put number values on them. Identify at least three points on your line.
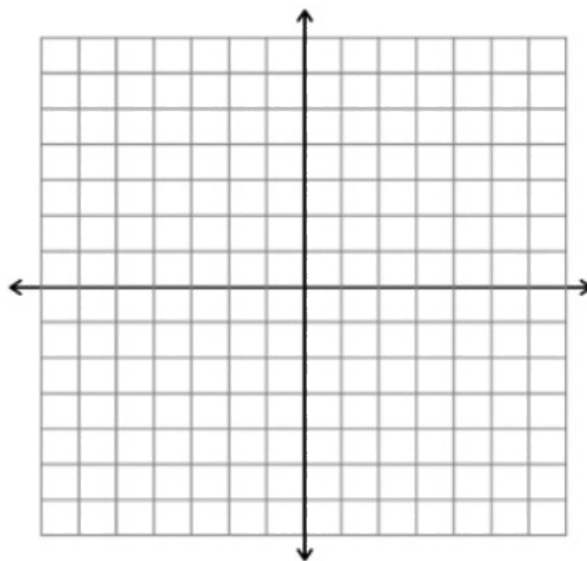
9. [5 points] Find the equation of the line that passes through $(-9, 4)$ and is perpendicular to the line $y = 3x + 10$.

10. [5 points] Solve by graphing the given system of equations. Be sure to label axis with x, y, and with numbers. Identify and label the intersection point.

$$\begin{cases} 3x + 5y = -12 \\ 2x - y = -8 \end{cases}$$
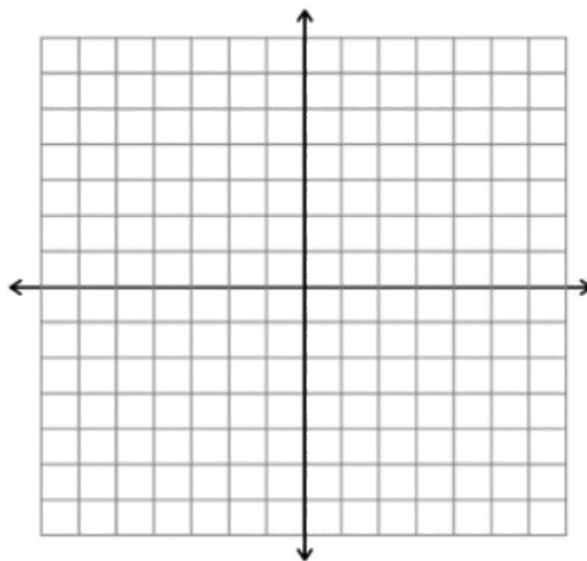
11. [6 points] On Friday, Leah picked up 8 cruellers and 16 cups of tea for the office staff and paid a total of $36.56. On Saturday, Leah picked up 4 cruellers and 12 cups of tea (from the same coffee shop) and paid a total of $22.64. How much does the coffee shop charge for one crueller? How much do they charge for one cup of tea?

12. [5 points] Graph the solution to the system of inequalities. Be sure to label the x and y axes.

$$\begin{cases} y \leq -x + 3 \\ x > 4 \end{cases}$$
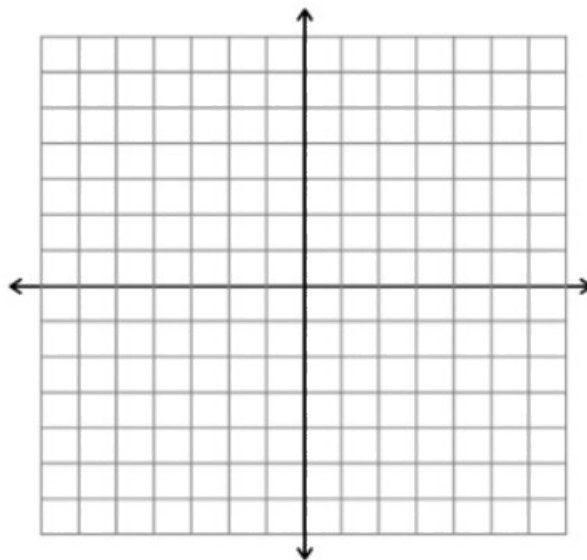
13. [5 points] Multiply and simplify your answer.

$$9x^8 y^7 z^5 \cdot 3x^4 y^{11} z^7 \cdot 2x^6$$

14. [5 points] Simplify. Express your answer with positive exponents. Assume that all variables are nonzero.

$$\frac{y^{-2} z^4}{x^{-5} z^{-3}}.$$

15. [5 points]

    (a) Write 3.814×10^7 in decimal notation.

    (b) Write 9.62×10^{-3} in decimal notation.

16. [5 points] Identify the degree and leading coefficient of the polynomial.

$$-2y^3 + 25y^2 - 8y - 10y^8 + 5y^4$$

Degree:_____
Leading Coefficient: _____

17. [5 points] Simplify $(-8r^2 + 9r - 14) - 4(7r - 9r^2 - 6)$.

18. [5 points] Multiply and simplify $(3x - 4)(4x + 5)$.

19. [5 points] Simplify. Express your answer with only positive exponents.

$$\frac{24a^8b^6c^9}{15a^7b^9}$$

20. [5 points] Divide. Write your answer in standard form, $Q(x) + \dfrac{R}{3x}$.

$$(24x^3 - 6x^2 - 12x + 8) \div (3x)$$