Math 2 Semester Exam Review

1. Rewrite $3x + 5y = 25$ so that y is a function of x.

2. Your paycheck amount **C** is directly proportional to the amount of time you work **t** with constant of proportionality **p**. Write an equation that correctly expresses this relationship.

3. The equation $5Q = \frac{t}{B}$ indicates a relationship between B, Q, and t. Rewrite so B is a function of Q and t.

4. Simplify the expression completely. Do not leave negative exponents in your answers. $\frac{10y^{10}}{4y^2}$

5. Fill in the following table with the correct slopes:

	Line 1 Slope: $m = \frac{2}{3}$	Line 1 Slope: $m = -\frac{1}{4}$	Line 1 Slope: $m = 5$
Slope of line perpendicular to Line 1			
Slope of line parallel to Line 1			

6. Match the following rules to their corresponding transformation.

Transformations	Rule	Answers
Translation		A. $(x, y) \rightarrow (-x, y)$ B. $(x, y) \rightarrow (kx, ky)$
Reflection across x-axis		C. $(x, y) \rightarrow (y, -x)$ D. $(x, y) \rightarrow (-x, -y)$
Size Transformation		E. $(x, y) \rightarrow (y, x)$ F. $(x, y) \rightarrow (x + h, y + k)$
90°CC rotation about origin		G. $(x, y) \rightarrow (x, -y)$ H. $(x, y) \rightarrow (-y, -x)$
Reflection across y=x		I. $(x, y) \rightarrow (-y, x)$
180°CC rotation about origin		
270°CC rotation about origin		
Reflection across y-axis		
Reflection across y=-x		

7. What is the distance between the points A(5, -3) and B(-2,10)?

8. What is the midpoint between the points A(6, -4) and B(-2,10)?

9. Select an expression that is equivalent to $4^{2/5}$.

A. $\sqrt[5]{4^2}$ B. $\sqrt[5]{2^2}$ C. $\sqrt{4^5}$ D. $\sqrt{5^2}$

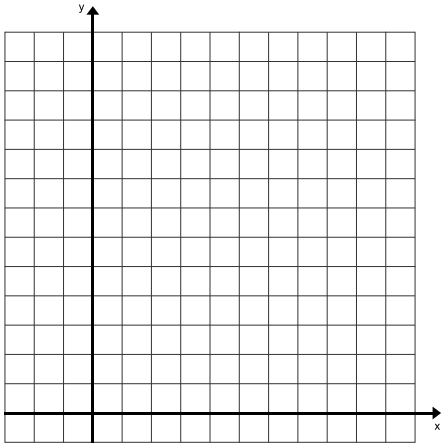
10. A circle in the standard (x, y) coordinate plane has center at $(4, -3)$ and has radius of 5. Write the equation of the circle.

11. Simplify the following expression completely. $(a^4b^2b)^5$. Your answer should be in the form $a^m b^n$.

12a. Find the coordinates of the fourth vertex that will make WXYZ a parallelogram. (_____,_____)

b. What type of quadrilateral does WXYZ appear to be? Be sure to provide mathematical justifications for your answer.

$$WXYZ = \begin{bmatrix} 1 & 6 & 10 & ? \\ 2 & 0 & 10 & ? \end{bmatrix}$$



13. To answer the following, refer to the equation $\boldsymbol{z = \frac{3y}{x}}$ where x, y, and z are all positive.

a. If x is held constant and y increases, how does z change?

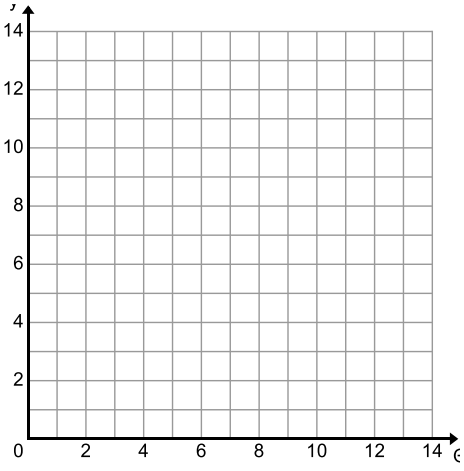
b. If y is held constant and x increases, how does z change?

14. Consider the following system of equations:

$y = -x + 13 \qquad 20x + 15y = 240$

a. Use an algebraic method to solve the system of equations.

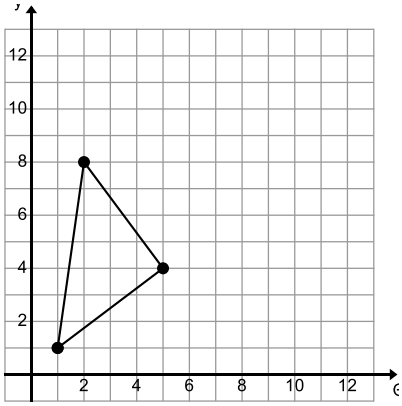
b. Graph the system of equations.



c. How does the solution you found in part a relate to the graphs in part b?

15. Triangle ABC is given on the graph to the right.

Use mathematical reasoning to prove it is a right triangle.

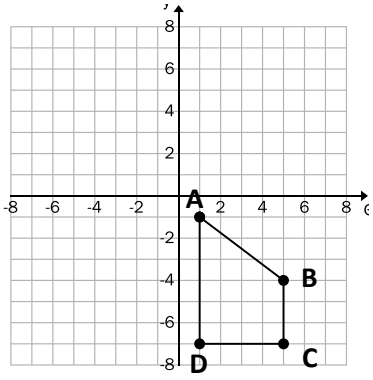


16. You are planning a huge graduation party. You decide to offer both a beef and a chicken meal at the party. The chicken dish costs $5, and the beef dish cost $7. There will be 250 people at the party, and the total cost of the food is $1500. Complete the parts below to find out how many beef meals and how many chicken meals you will have.

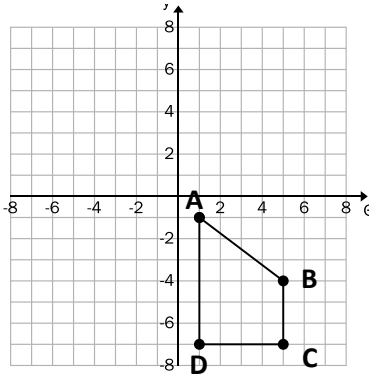
Write a system of linear equations to model this situation. You do not need to solve the system.

22. Use a rule to apply the following transformations to the quadrilateral ABCD, and then graph the image.

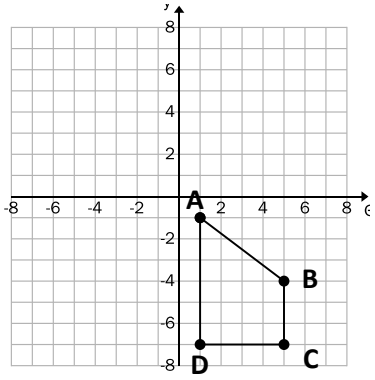
a. Reflection across x-axis



b. Counterclockwise rotation of 90º.



c. Size transformation of magnitude .5



23. Consider the transformation that is a composite of these two transformations in the order given.

Transformation 1: $(x, y) \rightarrow (2x, 2y)$ **Transformation 2:** $(x, y) \rightarrow \ (x + 1, y - 2)$

a. Find the image of quadrilateral QRST under the composition of transformations above.

$QRST = \begin{bmatrix} -13 & -10 & -6 & -9 \\ 8 & 4 & 7 & 11 \end{bmatrix}$ $Q'R'S'T' = \begin{bmatrix} & & & \end{bmatrix}$

b. Write a rule that describes this composition of transformations. $(x, y) \rightarrow$ (,)

c. The perimeter of QRST is 20 $units$. What is the perimeter of the image? Explain your answer or show your work.

d. The area of QRST is 25 $units^2$. What is the area of the image? Explain your answer or show your work