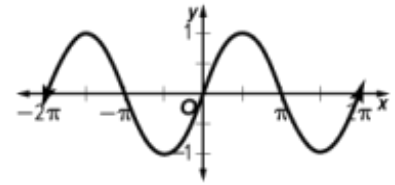


Name _____

Period _____

Algebra 2 Semester Exam REVIEW

1. The graph of a function is shown.
What is the domain and range of this function?



2. Which of the following define y as a function of x?

I	II	III												
<table><tr><th>x</th><th>y</th></tr><tr><td>-1</td><td>5</td></tr><tr><td>-2</td><td>2</td></tr><tr><td>-3</td><td>1</td></tr><tr><td>-4</td><td>2</td></tr><tr><td>-5</td><td>5</td></tr></table>	x	y	-1	5	-2	2	-3	1	-4	2	-5	5	$x^2 - 4 = y^2$	
x	y													
-1	5													
-2	2													
-3	1													
-4	2													
-5	5													

3. Choose the **even** function. Show work/explain.

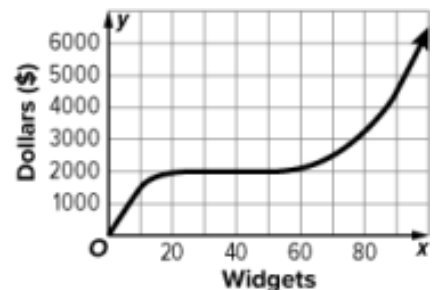
- a. $f(x) = 4x^3 - 2x^2$ b. $f(x) = x^3 + 2x$ c. $f(x) = 3x^2 + 2x$ d. $f(x) = -x^2 - 2$

4. Complete the sentence about the end behavior of $f(x) = x^2 + 3x + 2$. As x approaches positive or negative infinity, $f(x)$ approaches _____.

- a. $-\infty$ b. 0 c. 5 d. ∞

5. The graph shows the **revenue (\$)** function for widgets at the Columbus Widget Factory.

- a. Estimate the number of widgets produced when revenue is **\$2500**.
b. Over what interval of widgets produced does the Average Rate of Change of the function appear to be the **greatest**. Explain.

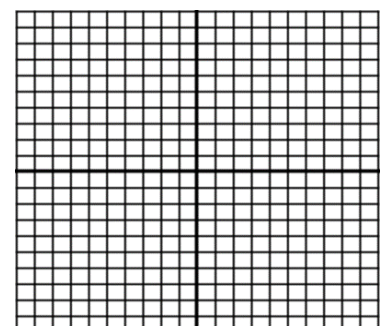


6. $y = -2|x + 3| + 4$

7. Now, **Graph each step** of the transformation:

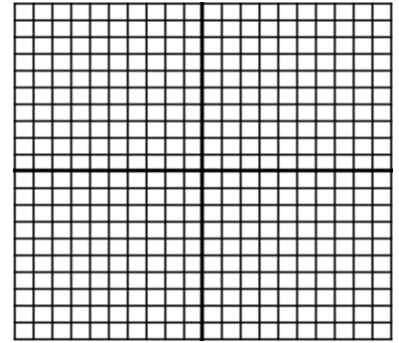
Identify the type of function _____

$-2|x + 3| + 4$



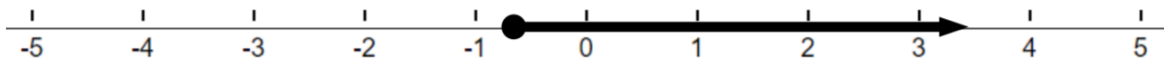
8. Graph of the inequality $5x - y < 2$.

Remember dashed/solid, shading, etc.



9. Solve $5x + 2 = -(4x + 3)$

10. This graph best represents the solution of which inequality?



a. $x < \frac{2}{3}$

b. $x \geq -\frac{2}{3}$

c. $x > -\frac{2}{3}$

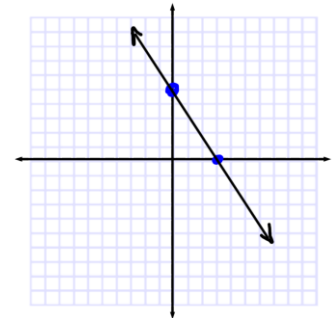
d. $x \leq -\frac{2}{3}$

11. The graph of the line is shown at the right.

Find $m =$ _____

Find $b =$ _____

Find $mb =$ _____



12. What is the solution to the system of equations?

SHOW OR EXPLAIN YOUR METHOD TO SOLVE.

$$2x + 6y = 18$$

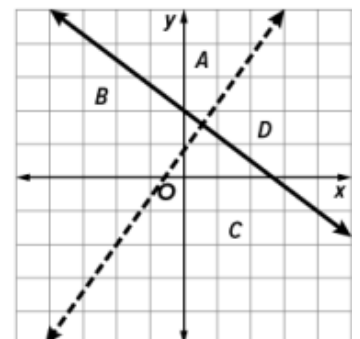
$$2x + 8y = 4$$

13. Identify the solution **region** represented by the system of inequalities:

Show work.

$$7x - 5y < -4$$

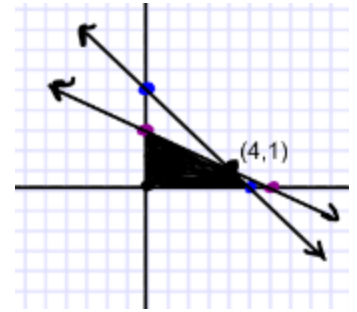
$$3x + 4y \leq 8$$



14. The graph is given. The feasible region based upon certain constraints is shown in the graph for the objective function $f(x, y) = 7x + 6y$.

Show your work to determine the Min and Max.

- a. Max: _____
b. Min: _____



15. Solve the system. **SHOW OR EXPLAIN YOUR METHOD TO SOLVE.**

$$x + y + z = 3$$

$$x - 3y + z = -5$$

$$x + y - z = 9$$

16. What is the average rate of change of $f(x)$ over the interval $[-3, 2]$.

SHOW WORK TO JUSTIFY YOUR ANSWER.

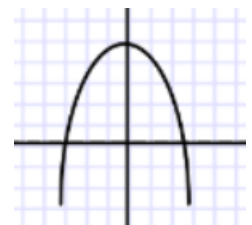
17. Solve and Graph $|9 - x| \geq 14$?

x	$f(x)$
-3	-3
-2	-5
-1	-3
0	3
2	13
3	27

18. Given the function $f(x) = x^2 + 5x + 3$ state:

Equation for Axis of symmetry _____ ; Vertex _____

19. Given the graph at the right, what are the apparent roots of the equation related to the function graphed on the coordinate grid?



20. Simplify i^{266}

21. Multiply binomials $(4 + 3i)(-6 - 4i)$

22. Factor $8x^2 - 10x - 18$

23. **3.5/3.6** The zeros of a quadratic functions are $-4 - \sqrt{11}$ and $-4 + \sqrt{11}$. The y-intercept is 5. What is the equation of the quadratic function?

a. $y = x^2 - 8x + 5$

b. $y = x^2 - 4x - 11$

c. $y = x^2 - 4x + 11$

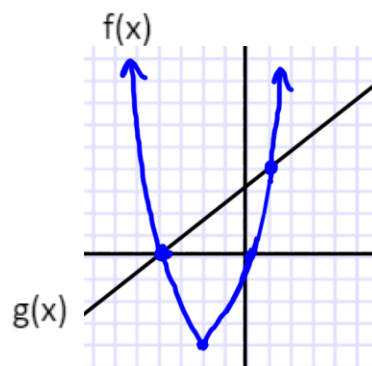
d. $y = x^2 + 8x + 5$

24. **3.5** Convert the equation $y = -2x^2 + 8x - 17$ to graphing/vertex form:

25. **3.3** Solve $x^2 - 2x + 4 = 0$

26. The quadratic equation $ax^2 + bx + c = 0$ has real solutions if _____, and has imaginary solutions if _____.

27. Using the graphs at the right, suppose $f(x) = x(x + 4)$ and $g(x) = x + 3$. What is the interval when $f(x) > g(x)$?



28. Solve the systems of equations. Identify your method.

$$y = 2x^2 - 3x + 8$$

$$y = -4x^2 + 11$$

29. A cannonball is shot into the air. Its height can be described by the equation $h = -3(t - 1)(t - 9)$, where h is the height of the cannonball in feet and t is the time in seconds.

Graph the function on your calculator and use the graph and/or table to describe what happens to the cannonball at certain values or intervals along its flight path. Drawing may help you!

Things to consider: At what time does the cannonball hit the ground? When is the cannonball at its highest point? How high is the highest point? When is the cannonball moving upward? downward?