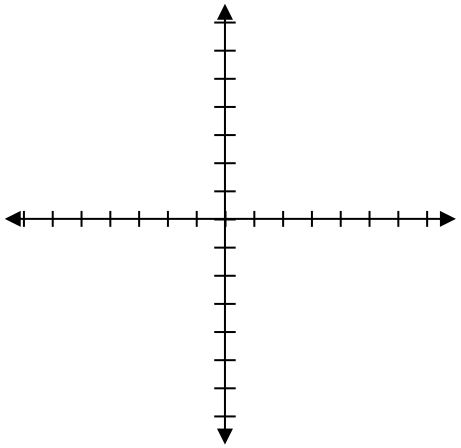
NAME_____DATE_____

ALGEBRA II WORKSHEET: QUADRATIC FUNCTIONS (STANDARD FORM)

1-5. Answer all prompts and graph the function on the axes provided.

1. $y = -x^2 + 6x - 8$



Vertex_____

Axis of Symmetry_____

x-intercept(s)_____

y-intercept_____

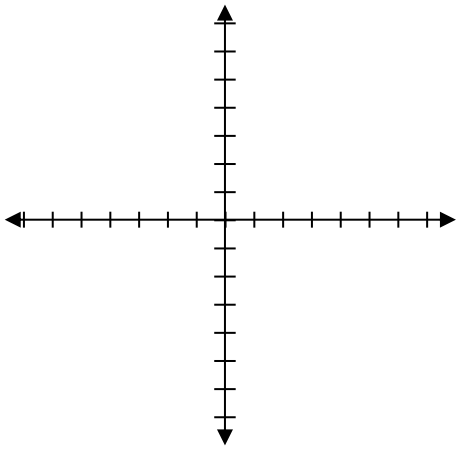
Concave Up or Down?_____

One Other Point on the Graph_____

Domain_____

Range_____

2. $y = 3x^2 - 18$



Vertex_____

Axis of Symmetry_____

x-intercept(s)_____

y-intercept_____

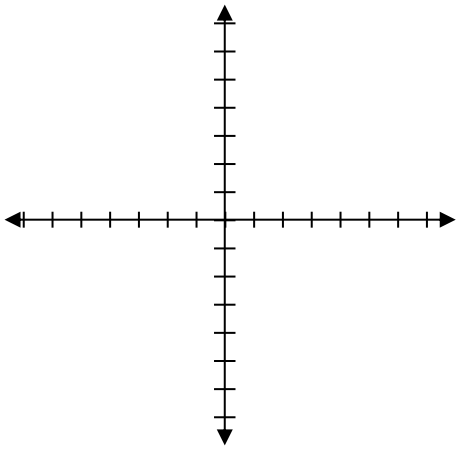
Concave Up or Down?_____

One Other Point on the Graph_____

Domain_____

Range_____

3. $y = x^2 + x + 4$



Vertex_____

Axis of Symmetry_____

x-intercept(s)_____

y-intercept_____

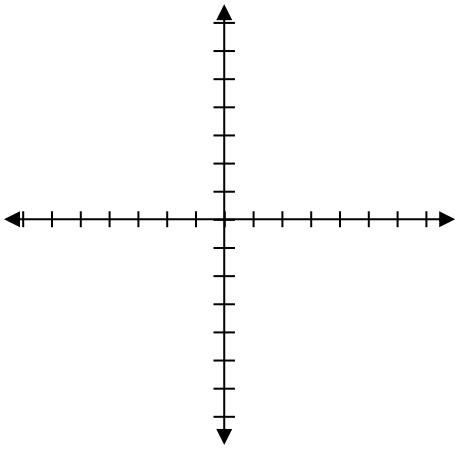
Concave Up or Down?_____

One Other Point on the Graph_____

Domain_____

Range_____

4. $y = -2x^2 + 7x + 9$



Vertex_____

Axis of Symmetry_____

x-intercept(s)_____

y-intercept_____

Concave Up or Down?_____

One Other Point on the Graph_____

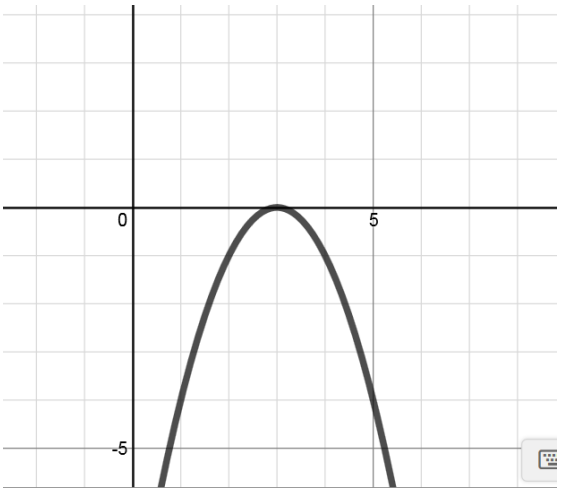
Domain_____

Range_____

5. Find the intersection point of the graphs of $\begin{aligned} y &= 3x-2 \\ y &= -x+4 \end{aligned}$.

6. Find the intersection point(s) of the graphs of $y = x^2 - x + 4$ and $y = x^2 + 3x - 2$.

7. Given the graph, answer each question.



   a. Is the graph concave up or concave down?

   b. The x-intercept(s) is/are _____.

   c. The y-intercept is approximately_____.

   d. The equation of the axis of symmetry is

      _____.

   e. The vertex is _____.

   f. Is the discriminant of the function positive, negative, or zero? _____

8. Write the equation of a quadratic function in standard form that is concave down and has two x-intercepts.

9. If the vertex of a quadratic function is (4, 5) and (-1, -5) is a point on the graph, what other point MUST also lie on the parabola?

10-12. Factor each polynomial completely.

10. $100x^3 - 64x$

11. $9x^2 - 22x + 8$

12. $a^2(b-2) - 8a(b-2) - 9(b-2)$

13.

$$b = 2.35 + 0.25x$$
$$c = 1.75 + 0.40x$$

In the equations above, b and c represent the price per pound, in dollars, of beef and chicken, respectively, x weeks after July 1 during last summer. What was the price per pound of beef when it was equal to the price per pound of chicken?

A) \$2.60

B) \$2.85

C) \$2.95

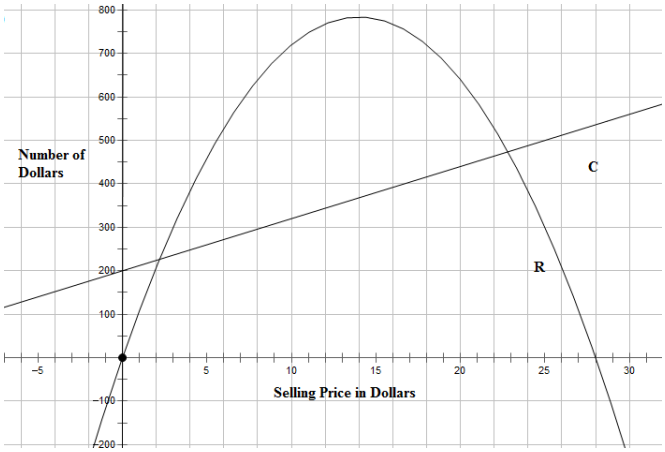
D) \$3.35

Revenue refers to the amount of money the company earns from selling a good or service. *For example, if a store sold 100 bottles of water for $2 each, then the store's revenue is $200.*

Cost refers to the amount of money the company must pay to create or purchase the goods or service. *If the same store purchased 100 bottles of water for $0.40 each, then the store's cost is $40.*

Profit refers to the net gain or loss from selling goods or services. It is the difference between the revenue and the cost. If a business has greater revenue than cost, then it makes a profit. If the cost is greater than the revenue, the business has a loss or negative profit. *For the store described above, their profit from selling the 100 water bottles was $200 - $40, or $160.*

9. The Math Department plans on producing t-shirts that read, "Math…It's Pi-Tastic!" The graph below shows the cost of producing t-shirts (labeled C) and the revenue earned from selling the shirts (labeled R), based on the price at which they will sell the shirts.



a. At what selling price will the Math Department earn the greatest revenue? What is the revenue they will earn by selling shirts at that price?

b. Why would the Math Department NOT want to sell t-shirts for $1 or for $25?

c. For what range of selling prices will the Math Department make a profit?

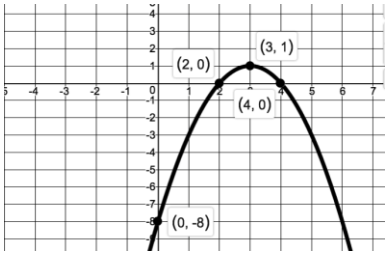
d. On what interval of x is the revenue function increasing? On what interval of x is the revenue function decreasing?

e. At what selling price will the Math Department make the greatest profit? Explain how you found your answer.

KEY FOR #'S 1-10

	1	2	3	4
Vertex	$(3,1)$	$(0,-18)$	$\left(-\frac{1}{2},\frac{15}{4}\right)$	$\left(\frac{7}{4},\frac{121}{8}\right)$
Axis of Symmetry	x= 3	x = 0	$x=-\frac{1}{2}$	$x=\frac{7}{4}$
x-Intercept	(2, 0) (4, 0)	$\left(\sqrt{6},0\right)$ $\left(-\sqrt{6},0\right)$	None	(-1, 0) $\left(\frac{9}{2},0\right)$
y-Intercept	(0, -8)	(0, -18)	(0, 4)	(0, 9)
Concavity	Down	Up	Up	Down
One Other Point (there are many possible answers)	(1, -3) (5, -3)	(1, -15) (-1, -15)	(1, 6) (2, 10)	(1, 14) (2, 15)
Domain	$x\in(-\infty,\infty)$	$x\in(-\infty,\infty)$	$x\in(-\infty,\infty)$	$x\in(-\infty,\infty)$
Range	$y\in(-\infty,1]$	$y\in[-18,\infty)$	$y\in\left[\frac{15}{4},\infty\right)$	$y\in\left(-\infty,\frac{121}{8}\right]$

1.



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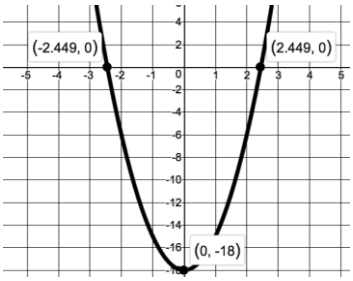

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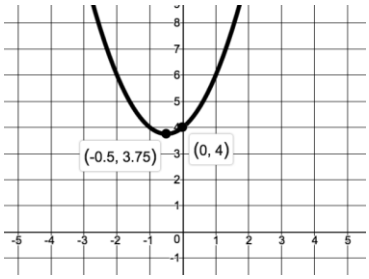

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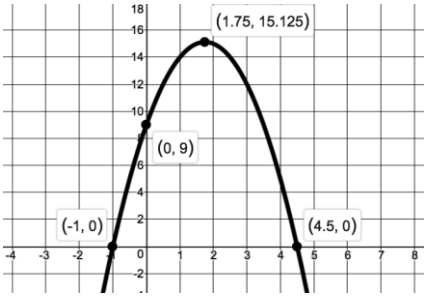

5. $\left(\frac{3}{2},\frac{5}{2}\right)$ 6. $\left(\frac{3}{2},\frac{19}{4}\right)$

7a. Down 7b. (3, 0) 7c. (0, -7) 7d. x = 3 7e. (3, 0) 7f. Zero

8. Answers may vary 9. (9, 5) 10. A