

SM3-A HW #6-11 (Quadratic Modeling: AREA)

Date _____ Period _____

- 1) A company's profit can be modeled by the equation $p(u) = -u^2 + 180u + 1000$ where 'u' is the number of units sold. Find the maximum profit of the company. How many units should the company sell to maximize profit? (hint: set your window to $x_{\min}=-20$, $x_{\max}=200$ to see the sides of the parabola then adjust your y_{\max} to see the vertex of the parabola.

- 2) The path of a football kicked by Nick Folk flies along a parabolic path that can be modeled by the following equation:
 $y = -0.026x(x-46)$ (where x is the horizontal position in yards and y is the height in yards. What is the maximum horizontal distance he can kick the ball?

- 3) The width of a rectangle is 3 more than twice its length. If the area of the rectangle is 100 square feet, what is the length and width of the rectangle?

- 4) The width of a rectangle is 4 more than 5 times its length. If the area of the rectangle is 1000 square feet, what is the length and width of the rectangle?

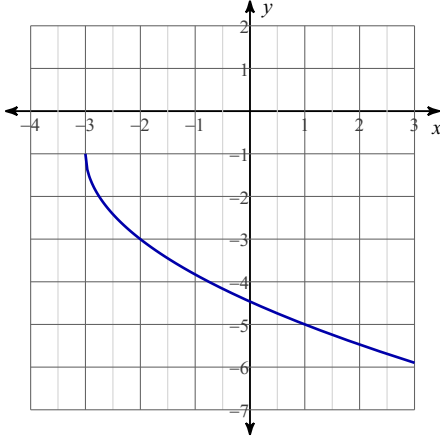
- 5) The length of a rectangle is 5 less than twice a number. The width of the rectangle is 5 more than the same number. If the area of the rectangle is 200 square feet,
 - a) What is the number?
 - b) what is the length of the rectangle
 - c) What is the width of the rectangle?

- 6) You have 250 feet of fence to build a rectangular corral adjacent to a lake. The side next to the lake is not fenced.
 - a) Write the equation used to calculate the area.
 - b) What is the maximum area enclosed by the fence?
 - c) What are the side lengths of the corral?

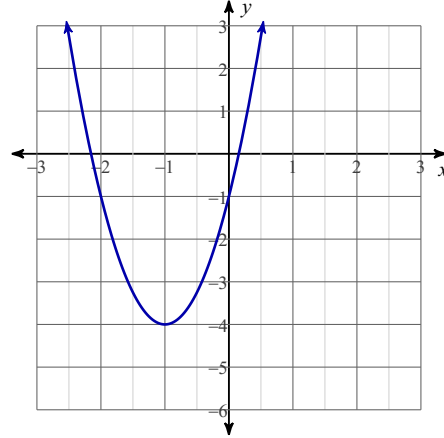
7) You have 300 feet of fence. What is the maximum area enclosed by the fence?

- a) Write the equation used to calculate the area.
- b) What is the maximum area enclosed by the fence?
- c) What are the side lengths of the corral?

8) What is the equation of the graph?



9) What is the equation of the graph?



- a) Factor each trinomial (provide the intercept form of the equation).
- b) Determine the "zeroes" of the equation (remember the Zero Product Property!)

10) $r^2 + 4r - 21 = 0$

11) $n^2 - 5n + 4 = 0$

12) $6v^2 + 4v - 10 = 0$

13) $21v^2 - 24v + 3 = 0$

Find the "zeroes" of the equations by finding square roots.

14) $x^2 = -63$

15) $y = 2(x + 3)^2 + 24$

a) Convert these unfactorable standard form quadratic equations to vertex form

b) Find the zeroes

16) $m^2 + 4m - 53 = 0$

17) $x^2 + 18x + 79 = 0$