

# Unit 3 – 6

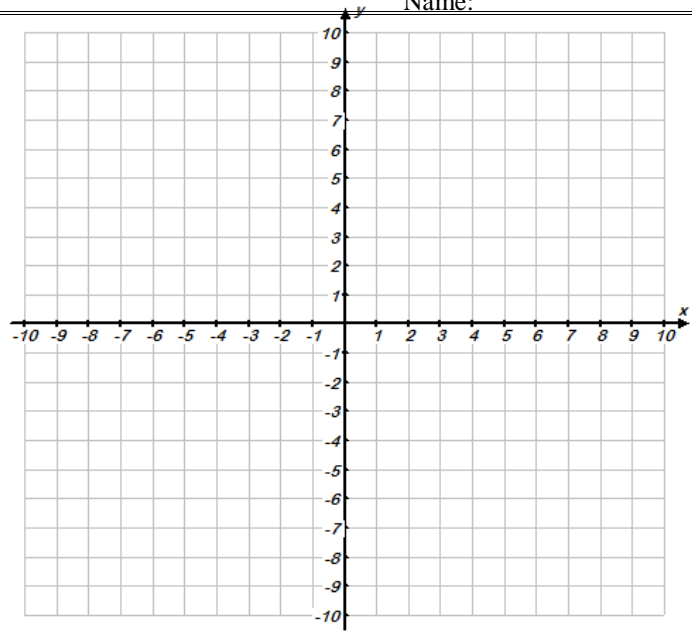
Name: \_\_\_\_\_

1. Consider the function:  $f(x) = x^2 + x - 6$

a. What are the zeros of the function (using factoring)?

b. What is the axis of symmetry of the parabola?

c. What is the vertex of the parabola (graph the parabola)?

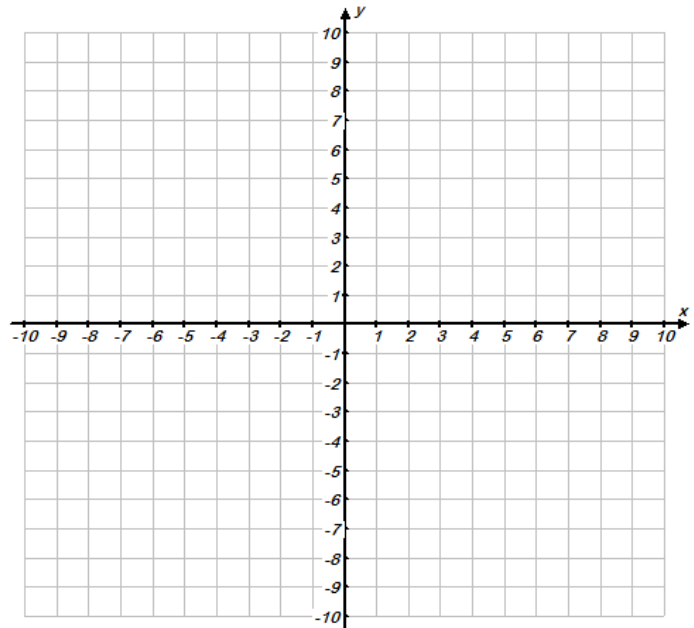


2. Consider the function:  $f(x) = -x^2 + 8x - 15$

a. What are the zeros of the function (using factoring)?

b. What is the axis of symmetry of the parabola?

c. What is the vertex of the parabola (graph the parabola)?

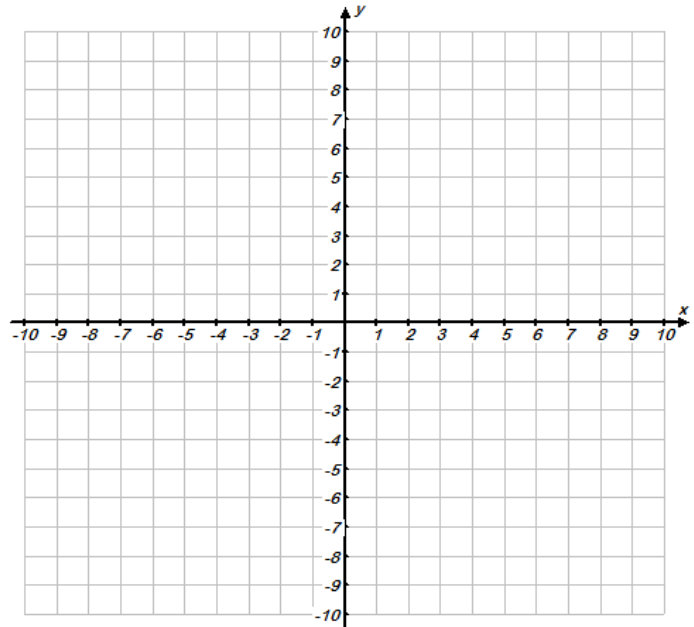


3. Consider the function:  $f(x) = 2x^2 + x - 3$

a. What are the zeros of the function (using factoring)?

b. What is the axis of symmetry of the parabola?

c. What is the vertex of the parabola (graph the parabola)?



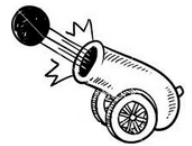
23. The expression  $P = -x^2 + 70x - 600$  represents a company's profit for selling  $x$  items.
- a. What are the break-even point(s) for selling  $x$  items (i.e. how many items sold yields a profit of 0?)



b. Is the vertex a minimum or maximum?

c. If the model is accurate, how many items should the company sell to maximize their profit and what is the maximum profit?

24. The expression  $h = -16t^2 + 400t + 5$  represents the height of a cannonball  $t$  seconds after it was fired. What is the maximum height of the cannon ball and how many seconds did it take to reach its maximum height?



25. The expression  $C = x^2 - 44x + 490$  represents the cost in \$1000 of dollars per year that company must spend out of pocket on each employee for health insurance for  $x$  number of employees. How many employees should the company hire to minimize their cost of health insurance?

