

# Functions Worksheet 5

1. Find the coordinates for the vertex of the parabola  $y = 2x^2 - 12x + 4$
2. Find the  $x$ -intercepts of  $y = 7x^2 - 5x$ .
3. Solve  $x^2 - 5x + 6 = 0$ .
4. Complete the square to solve  $x^2 - 6x - 2 = 0$  for  $x$ .
5. Solve  $3x^2 - 5x + 1 = 0$ .
6. If we write the equation for the height of an object during projectile motion as  $h(t) = -5t^2 + 3t$ . At what time will the object be at the highest point in its trajectory?
7. The quantity of a car  $C$  after time  $t$  can be written  $C(t) = 1.02^t$ . Is the quantity of the car growing or decaying? Identify the percent rate of change from the equation for  $C(t)$
8. If we write Kinetic Energy (KE) as  $KE(v) = \frac{1}{2}mv^2$ , we know that the vertex exists at  $v = 0$ . Rewrite the equation assuming an additional velocity of 5 m/s.
9. The quantity of a porcelain doll after time  $t$  can be written  $D(t) = 50(0.97)^t$ . Is the quantity of the doll growing or decaying? Identify the percent rate of change from the equation for  $D(t)$ .
10. What are the coordinates of the vertex of  $y = -3x^2 + 6x + 15$ ? Is the vertex a maximum or a minimum?