

## Section 4.5 Practice Master

1. Sketch each parabola. Label the vertex and the  $x$ -intercepts.

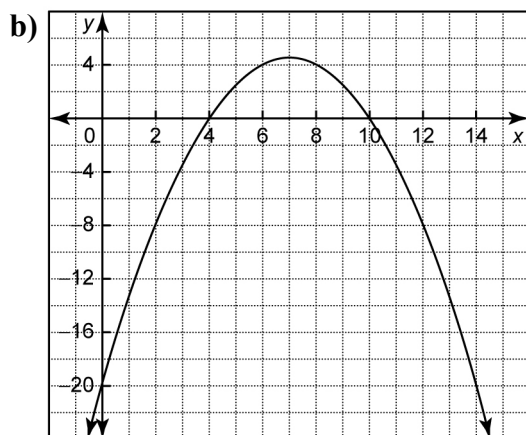
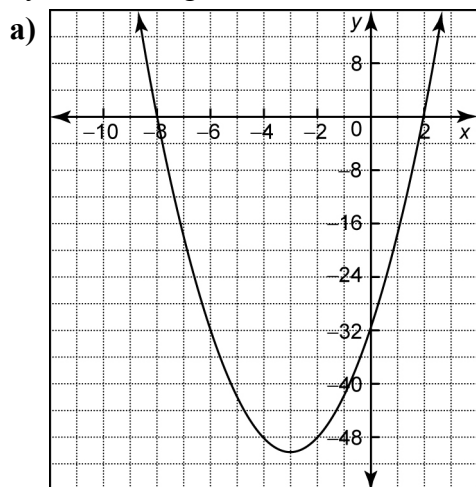
a)  $y = (x + 2)(x - 4)$

b)  $y = -(x - 6)(x + 4)$

c)  $y = 2(x + 8)(x + 2)$

d)  $y = -\frac{1}{2}(x - 3)(x - 7)$

2. Determine an equation in the form  $y = a(x - r)(x - s)$  to represent each parabola by considering the vertex and the  $x$ -intercepts.



3. Consider the quadratic relation  $y = (x - 3)^2$ .

a) Sketch the parabola.

b) Write the coordinates of the vertex.

c) How many  $x$ -intercepts does the parabola have?

4. The path of a rocket is given by the relation  $h = -5(x - 2)(x - 12)$ , where  $x$  represents the horizontal distance, in metres, the rocket travels and  $h$  represents the height, in metres, above the ground of the rocket at this horizontal distance.

a) Sketch the path of the rocket.

b) What is the maximum height of the rocket?

c) What is the horizontal distance when this occurs?

d) What is the height of the rocket at a horizontal distance of 5 m?

e) Find another horizontal distance where the height is the same as in part d).

5. The path of a kicked football can be modelled by the relation  $h = -0.02x(x - 45)$ , where  $h$  represents the height, in metres, above the ground and  $x$  represents the horizontal distance, in metres, measured from the kicker.

a) When the ball hits the ground, how far has it travelled?

b) If the goal post is 40 m away, will the kick clear the 3-m-high crossbar for a field goal?