Building Equations in Factored Form
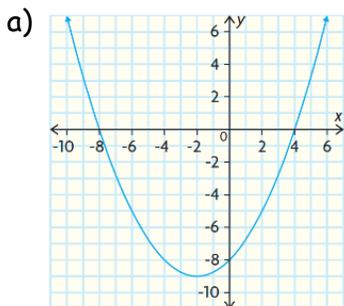
1. Determine an equation for each quadratic relation.

a)

b) It has zeros at (2,0) and (-6,0) and passes through the point (3,5)

c) It has zeros at (5, 0) and (0, 0) and a minimum value of -10.

2. Sometimes the equation $y = a(x - s)(x - t)$ cannot be used to determine the equation of a parabola from its graph. Explain when this is not possible and draw a graph to illustrate.

3. The x-intercepts of a parabola are -3 and 5. The parabola crosses the y-axis at -75.
   a) Determine an equation for the parabola.
   b) Determine the coordinates of the vertex.

4. Ryan owns a small music store. He currently charges $10 for each CD. At this price, he sells about 80 CDs a week. Experience has taught him that a $1 increase in the price of a CD means a drop of about five CDs per week in sales. At what price should Ryan sell his CDs to maximize his revenue?

5. Rahj owns a hardware store. For every increase of 10¢ in the price of a package of batteries, he estimates that sales decrease by 10 packages per day. The store normally sells 700 packages of batteries per day, at $5.00 per package.
   a) Determine an equation for the revenue, R, when x packages of batteries are sold.
   b) What price optimizes the revenue?
   c) How many packages of batteries are sold when the revenue is at a maximum?
   d) What is the maximum daily revenue that Rahj can expect from battery sales?