

**1.6 Determine a Quadratic Equation Given Its Roots****BLM 1-7**

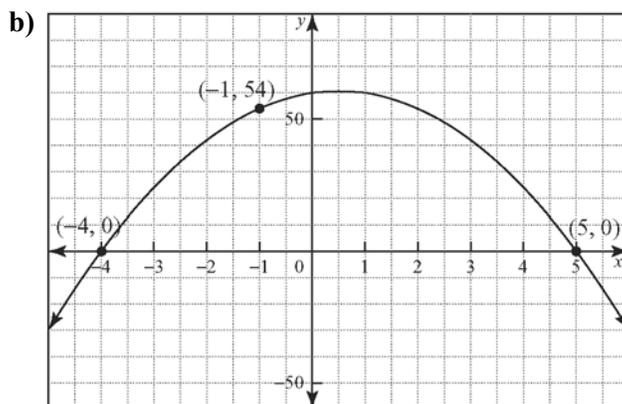
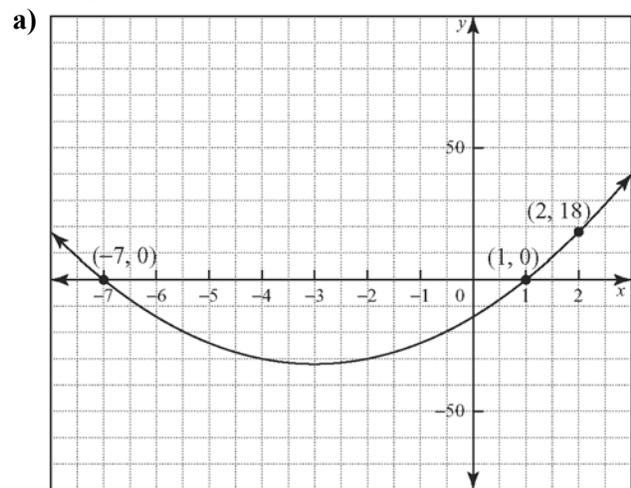
1. Determine the equation of the quadratic function that has the given zeros and contains the given point. Express each function in factored form.

- 3 and  $-4$ , point  $(2, 3)$
- $-2$  and  $2$ , point  $(3, 10)$
- 5 and  $11$ , point  $(7, 12)$
- $-5$  and  $-11$ , point  $(-8, -27)$

2. A golfer needs to hit a shot that will just clear a 10-m-tall tree that is 50 m in front of her. The ball must then continue to the green, which is 65 m away and at the same elevation as the ball's starting point.

- Use the information given to determine the quadratic equation that describes the path of the ball in terms of height,  $h$ , in metres, as a function of the horizontal distance,  $d$ , in metres, that the ball travels.
- Use this equation to determine the height of the ball when it has travelled a horizontal distance of 35 m.

3. For each given graph, determine the equation of the quadratic function, in standard form.



- Explain how to verify the results for question 3 using a graphing calculator. How will this procedure verify the results?
- A quadratic function has only one zero at 5. The function passes through the point  $(3, 20)$ .
  - Is there enough information to find the equation for the quadratic function?
  - If there is enough information, find the equation of the function. If there is not enough information, what other information is needed to find the equation?
- Lionel stands 10 m from a school wall that is 20 m tall. He throws a tennis ball onto the school roof in such a way that the ball reaches its maximum height just as it reaches the top of the wall. The path that the ball follows can be defined by a quadratic function. Consider the ground as the  $x$ -axis and the wall of the school as the  $y$ -axis.
  - Determine the coordinates of the zeros.
  - Give the coordinates of the vertex.
  - Determine the equation of the quadratic function in standard form.
- A bridge is supported by an arch in the shape of a parabolic curve. The ends of the arch are on either side of the river that the bridge spans, 280 m apart. The top of the arch is at the centre of the bridge and is 70 m above the river. Determine the quadratic function that models the arch, in factored and standard form, using one end of the arch as the origin.

