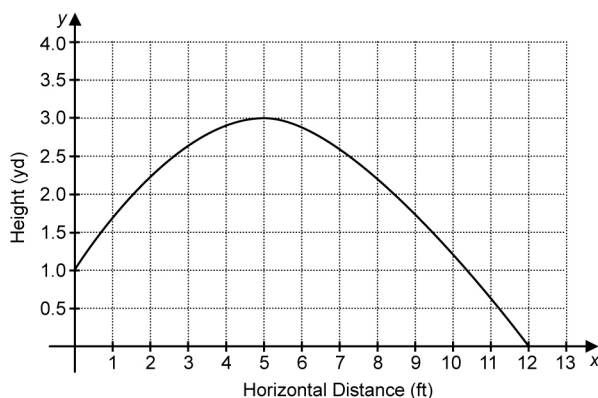


## Chapter 8 Review

### 8.1 Interpret Quadratic Relations

1. The graph below shows the height and horizontal distance of a volleyball after it was served.



- What was the maximum height reached by the ball?
  - How long did it take the ball to reach this maximum height?
  - From what height was the ball served?
2. The table shows the height and horizontal distance of a softball after it was hit.

Horizontal Distance (m)	Height (m)
0	0
10	5
20	15
30	30
40	15

- Use a graphing calculator to graph the data.
- Find the equation of the curve of best fit.
- Determine the horizontal distance travelled by the ball when it reached its maximum height.

3. The table shows the height of a cyclist over time as she travels from one side of a bridge, over its peak, to the other side.

Time (s)	Height (m)
0	0
10	3
20	5
30	6
40	5

- Use a graphing calculator to graph the data.
- Find the equation of the curve of best fit.
- What is the height of the bridge at its highest point?
- How long did it take the cyclist to reach the highest point?

### 8.2 Represent Quadratic Relations in Different Ways

4. Consider the quadratic relation  $y = x^2 - 13x + 30$ .
- Does the relation have a maximum or a minimum value? Explain.
  - Identify the y-intercept.
  - Identify the zeros of the relation.
5. Eva's convenience store has daily expenses that can be modelled by the quadratic relation  $C = 2t^2 - 14t + 20$ , where  $C$  is the total cost in dollars, and  $t$  is the time in hours that the store is open.
- What is the minimum cost of running the store each day?
  - What is the number of hours the store is open for this minimum cost?
  - What is the cost per day when the store is not open for business?

**8.3 The Quadratic Relation  $y = ax^2 + c$** 

6. A skydiver jumped out of an airplane. The path of the skydiver can be modelled by the relation  $h = -50t^2 + 5000$ , where  $h$  represents the height of the skydiver above the ground, in metres, and  $t$  represents time in seconds.
- From what height did the skydiver jump out of the plane?
  - How long did it take the skydiver to reach the ground?
7. The time taken to climb from the bottom of a gorge to the top can be modelled by the relation  $d = 40t^2 - 4000$ , where  $d$  is the distance between the climber and the top of the gorge in metres, and  $t$  is time in seconds.
- How deep is the gorge?
  - How long will it take a climber to reach the top?

**8.4 Solve Problems Involving Quadratic Relations**

8. Dawn owns a pogo stick. She wants to see how high she can jump. The path of one jump can be modelled by the relation  $h = -2t^2 + 40t + 6$ , where  $h$  represents Dawn's height above the ground in centimetres and  $t$  represents time in seconds.
- When Dawn puts her feet on the pogo stick, what is the height of her feet above the ground?
  - What is the maximum height Dawn reaches?
  - How long does it take Dawn to reach the maximum height?
9. A basketball team sells tickets for \$12. The owners want to increase their revenues, so they increase prices. They have noticed that ticket sales decrease by 120 tickets every time the price is increased by \$1.20. The quadratic relation that models the situation is  $R = -60m^2 + 1200m + 12000$ , where  $R$  represents revenue in dollars and  $m$  represents the number of times the price is increased by \$1.20.
- Determine the maximum revenue.
  - How many times does the ticket price have to be increased to reach the maximum revenue?
  - What is the ticket price that results in the maximum revenue?