

# Solving Problems Using Quadratic Models

## Example 1:

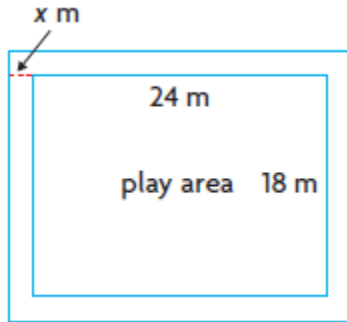
A Frisbee is thrown into the air and its height in feet as a function of time in seconds is given by the function  $h(t) = -2t^2 + 3t + 5$ .

- a. How high above the ground is the Frisbee just before it is thrown?
- b. How high is the Frisbee after 2 seconds?
- c. When does the Frisbee reach a height of 4 ft?
- d. When does the Frisbee hit the ground?
- e. How long does it take for the Frisbee to reach its maximum height?
- f. What maximum height is reached by the Frisbee?



**Example 3:**

Ian has been hired to lay a path of uniform width, using crushed rock, around a 24 m by 18 m rectangular play area. He has enough crushed rock to cover  $145 \text{ m}^2$ . If Ian uses all the crushed rock, how wide will the path be? Verify your solution.

**Solution:**

We need to determine the width of the path that will result in an area of  $145 \text{ m}^2$ .

$$\text{Area of path} = \text{Total area} - \text{Play area}$$

$$\text{Area of path} =$$

Substitute  $145 \text{ m}^2$  for the area of the path and solve the equation for  $x$ :

**Example 4:**

Determine three consecutive odd integers such that the square of the largest integer is 33 less than the sum of the squares of the two smallest integers.

**Solution:**

**Example 5:**

At noon, a sailboat leaves a harbor on Vancouver Island and travels due west at 10 km/h. Three hours later, another sailboat leaves the same harbor and travels due south at 15 km/h. At what time, to the nearest minute, will the sailboats be 40 km apart?

**Solution:**

Let  $x$  represent \_\_\_\_\_.

