

Practise

A

For help with questions 1 and 2, refer to Example 1.

1. Find the y -intercept for each relation.

a) $y = -15x^2 + 25x - 7$

b) $y = 0.45x^2 - 0.17x + 20$

c) $y = 20(x - 12)^2 + 15$

d) $y = -0.5(x + 1.5)^2 + 4.5$

e) $y = 10x^2 + 8x - 3$

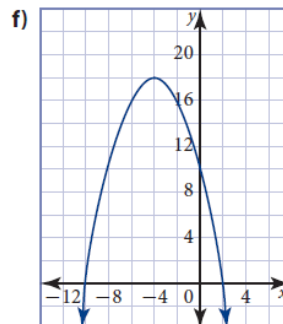
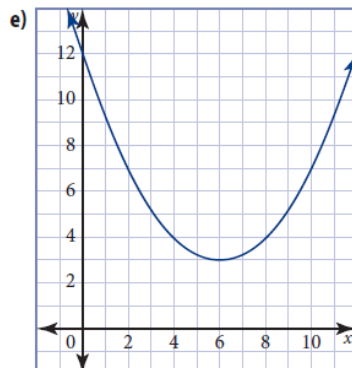
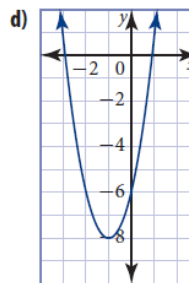
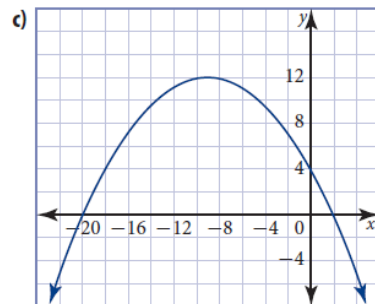
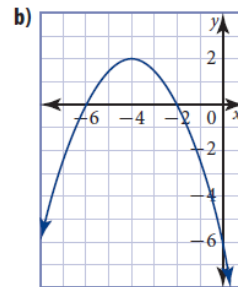
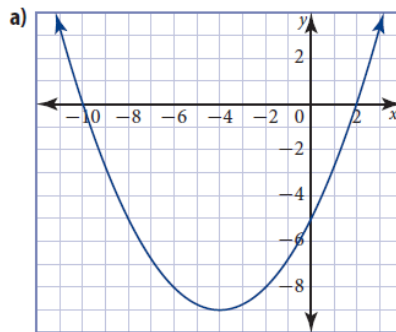
f) $y = 0.2(x - 3.4)^2 + 1$

g) $y = -0.1x^2 - 0.4x - 1.8$

h) $y = -3(x + 2)^2 - 9$

2. For each parabola, identify

- the x -intercepts
- the y -intercept
- the maximum or minimum value
- the coordinates of the vertex

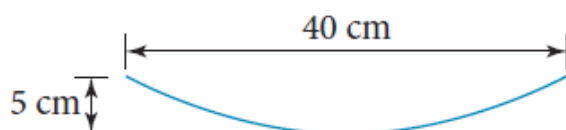


4. The Windsor–Detroit International Freedom Festival hosts one of the largest fireworks displays in the world. The fireworks are set off over the Detroit River. The path of a particular firework rocket is modelled by the relation $h = -4.9(t - 2)^2 + 169.6$, where h is the rocket's height above the water, in metres, and t is the time, in seconds.

- a) How long will the rocket take to reach its maximum height? What is the maximum height?
- b) A firework rocket will stay lit for an average of 5 s. What will the height of a rocket be 5 s after it is launched?



6. The shape of a satellite dish is parabolic. The dish is 5 cm deep and 40 cm wide. Write a relation of the form $y = a(x - h)^2 + k$ that models the shape of this dish. What assumption are you making?



7. A projectile is fired straight up from the ground. It reaches a maximum height of 101.25 m after 4.5 s. Then, it falls to the ground 4.5 s later.
- a) Write a relation that models this situation.
- b) What is the height of the projectile after 3 s? Is there another time when the projectile is at the same height above the ground? Explain.