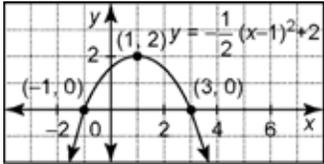


Chapter 3 Practice Test

- What is the x -coordinate of the vertex of the quadratic function $y = (x - \frac{1}{2})(x + \frac{3}{2})$?
 - $-\frac{1}{2}$
 - $\frac{3}{2}$
 - 7.25
 - $\frac{1}{2}$
- What are the x -intercepts of the quadratic function $y = 4(x + 1)^2 - 9$?
 - $\frac{5}{2}, -\frac{1}{2}$
 - $-\frac{5}{2}, \frac{1}{2}$
 - 1, -9
 - 1, -9
- Which statement is true about the equation $4x^2 + 3x + 1 = 0$?
 - The discriminant is zero, so there are two real roots.
 - The discriminant is greater than zero, so there is one real root.
 - The discriminant is less than zero, so there are two real roots.
 - The discriminant is less than zero, so there are no real roots.
- What are the coordinates of the vertex of the quadratic function $y = x^2 + 2x + 6$?
 - (5, 2)
 - (-1, 6)
 - (-1, 5)
 - (3, -6)
- The vertex of a quadratic function is $(-5, -1)$. The coordinates of another point on the function are $(0, 15)$. Write an equation for the quadratic function.
- Write an equation for this quadratic function.
 
 - What is the equation of the axis of symmetry?
 - On what interval is the function increasing?
 - On what interval is the function positive?
- Cacee threw a shot putt into the air. The path of the shot putt is modelled by the quadratic function $h(d) = -\frac{1}{8}d^2 + d + 2$, where h is the height of the ball above ground, in metres, and d is the horizontal distance of the shot putt from Cacee, in metres.
 - What is the maximum height of the shot putt?
 - At what distance from Cacee does the shot putt reach its maximum height?
 - How far did Cacee throw the shot putt? Assume that the distance is measured to where the ball first bounces. Round to the nearest tenth of a metre.
 - How far above the ground did Cacee release the shot putt?

Name: _____

Date: _____

8. Sean owns a sports therapy clinic. He charges \$75 for a 1-h treatment. At this rate, the clinic has 30 customers per day on average. A market survey showed that for every \$5 decrease in price, 6 more customers would come to the clinic each day.
- Write an equation for the revenue using an expression for the price multiplied by an expression for the number of customers.
 - What is the maximum revenue Sean can generate in a given day?
 - At what price will this maximum revenue be generated?
 - How many customers will Sean's clinic serve each day if he increases the price to \$100 for a 1-h treatment?

9. Maayan is bouncing on a pogo stick. The table shows Maayan's height above the ground at given time intervals.

t (s)	h (m)
0.1	0.08
0.3	0.28
0.4	0.33
0.6	0.38
0.8	0.38
0.9	0.36
1.0	0.32
1.1	0.25
1.3	0.12
1.4	0.01

- Draw a scatter plot of the data and a curve of best fit.
- Estimate the coordinates of the vertex.
- Write an equation that approximates the data.
- Use the equation to estimate the times at which Maayan is 10 cm above the ground.

10. A rocket is fired into the air. Without the effect of gravity, it would have travelled upward 49 m every second. However, because its upward motion was slowed by gravity, its height at the end of the first second was 4.9 m less than 49 m. In each second after the first, the rocket travelled upward 9.8 m less than the previous second.
- Make a table of values showing the height of the rocket at the end of each second.
 - After how many seconds was the rocket at its maximum height? What was the maximum height?
 - Assume that the data models a quadratic function. Write an equation describing the height of the rocket as a function of time since it was fired.
 - At what time will the rocket land?