

Chapter 3 Test

For questions 1 to 4, select the best answer.

- The x -intercepts of the quadratic function $y = 2x^2 - 6x - 20$ are
 - 2 and -3
 - 6 and -1
 - -2 and 5
 - -5 and 2
- What is the y -intercept of the quadratic function $y = 9x^2 - 36x - 1$?
 - 6
 - -1
 - -3
 - 1
- What is the maximum value of the quadratic function $y = -3x^2 + 6x + 24$?
 - 9
 - 0
 - 24
 - 27
- Which quadratic function is equivalent to $y = 2x^2 - 16x + 24$ and is in vertex form?
 - $y = 2(x - 4)^2 - 8$
 - $y = 2(x + 4)^2 + 16$
 - $y = 2(x - 6)(x - 2)$
 - $y = 2(x - 8)^2 + 2$
- Determine the number of real roots for each equation. Then, find the roots of each equation by factoring, if possible.
 - $5x^2 - 8x + 3 = 0$
 - $x^2 + x + 1 = 0$
 - $2x^2 + 8x + 8 = 0$
- Determine the key features of each graph. Find the x -intercepts, the y -intercept, the coordinates of the vertex, and the equation of the axis of symmetry. Then, sketch the graph and label the features.
 - $y = x^2 - 6x - 7$
 - $y = -2x^2 + 18$
- Solve each equation using the most appropriate method.
 - $3x^2 + 11x - 4 = 0$
 - $5x^2 - 14x + 8 = 0$
 - $3x^2 - 27x = 0$
 - $4(2x^2 + 1) = (x + 4)^2$
- A diver jumps from a 10-m platform. Her height, h , in metres above the water, after t seconds, can be approximated by the function $h(t) = -5t^2 + 5t + 10$.
 - Sketch a graph of the path of the diver.
 - Determine the maximum height of the diver above the water and the time at which she reaches the maximum height.
 - How high above the water is the diver after 1 s?

Name: _____

Date: _____

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9. The student council is selling boxes of oranges to raise money. A box of oranges sells for \$4.00. At that price the student council expects to sell 60 boxes. They figure that for every \$0.20 decrease in price they can sell an extra 10 boxes.
- Write expressions for the price of a box of oranges and the number of boxes of oranges sold.
 - Write an equation for the revenue using your expressions from part a).
 - What price will generate the maximum revenue?
 - The 60 boxes of oranges cost the student council \$100, and the council wants to raise \$265. Will the student council raise enough money to have the \$265 and cover the cost of purchasing the oranges?
10. A tennis ball is hit from an initial height of 0.5 m. The equation that models the path of the tennis ball is $h(t) = -0.125d^2 + d + 0.5$, where h is the height of the ball, in metres, and d is the horizontal distance from the tennis player, in metres.
- Find the maximum height of the ball and the distance from the tennis player when the ball reaches maximum height, both in metres.
 - How far has the tennis ball travelled horizontally, in metres, when it hits the ground?
 - For what horizontal distance, in metres, is the tennis ball higher than 2 m?
 - The ball was hit directly toward the net, which is 0.6 m from the player and 0.95 m in height. Will the ball make it over the net? Justify your answer.