**Chapter 12 Unit Test - Quadratic Functions**

**Name_____Section_____**

**Be sure to show all your work and circle your answer.**

**Solve the following using the square root property:**

1) $2x^2 - 5 = 0$

2) $(3x - 4)^2 + 7 = -29$

**Solve the following by completing the square:**

3) $x^2 - 12x - 3 = 0$

4) $2x^2 - x = 10$

**Solve the following using the quadratic formula:**

5) $3x^2 + 7x = 6$

6) $2x^2 = 4(3x - 5)$

**Solve the following:**

7) $125x^3 + 64 = 0$

8) $2\sqrt[3]{x^2} - \sqrt[3]{x} = 3$

9) $(x^2 + 4)^2 - 4(x^2 + 4) - 5 = 0$

10) $S = vt - 0.5gt^2$ for t $(t \geq 0)$

**Use the discriminant to determine the number and type of solutions:**

11) $-4x^2 + 4.3x - 11 = 0$

12) $3x^2 - 5x - 17 = 0$

**Find the vertex, the axis of symmetry, & sketch the graph of the following:**

13) $y = -(x - 1)^2 + 4$

14) $y = 2x^2 + 8x + 5$

**Find the intercepts of the following:**

15) $f(x) = x^2 - 8x + 5$

**Solve the following**

16) The total cost function for Mr. McBee's Bubble Gum is given by $C(x) = 2x^2 - 12x + 25$, where x is the number of pounds of bubble gum produced and C(x) is the cost in dollars. How many pounds of bubble gum should be produced to minimize the cost? What is the minimum cost?

**Answers**

1) $\left\{-\frac{\sqrt{10}}{2}, \frac{\sqrt{10}}{2}\right\}$ 2) $\left\{\frac{4-6i}{3}, \frac{4+6i}{3}\right\}$ 3) $\{6-\sqrt{39}, 6+\sqrt{39}\}$

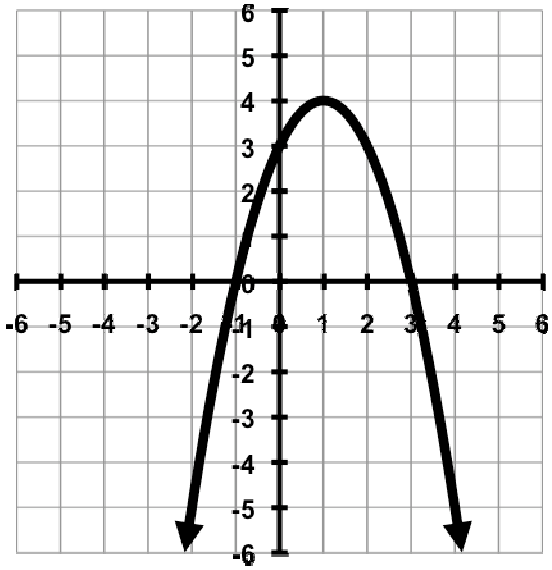
4) $\{-2, 2.5\}$ 5) $\left\{-3, \frac{2}{3}\right\}$ 6) $\{3-i, 3+i\}$

7) $\left\{-\frac{4}{5}, \frac{2-2i\sqrt{3}}{5}, \frac{2+2i\sqrt{3}}{5}\right\}$ 8) $\left\{-\frac{27}{8}, 1\right\}$ 9) $\{-i\sqrt{5}, i\sqrt{5}, -1, 1\}$

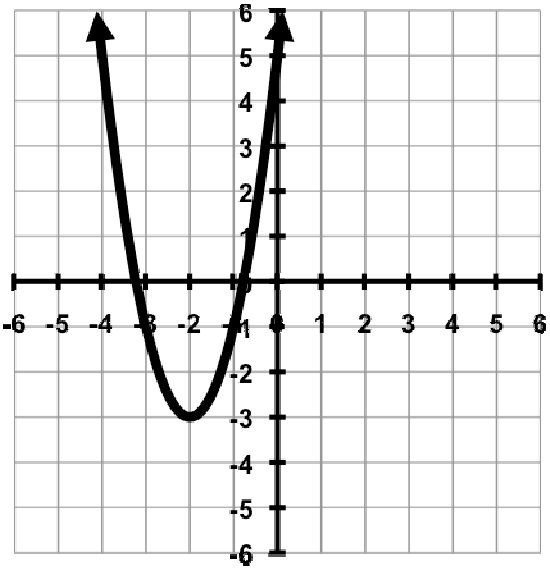
10) $t = \frac{v+\sqrt{v^2+2gS}}{g}$ 11) Two non-real complex conjugates

12) Two irrational real numbers

13) Vertex: (1, 4)
Axis of symmetry: x = 1



14) Vertex: (– 2, – 3)
Axis of symmetry: x = – 2



15) y-int: (0, 5) x-int(s): $(4-\sqrt{11}, 0)$ & $(4+\sqrt{11}, 0)$

16) Three pounds of gum should be produced to minimize the cost. The minimum cost is \$7.