Algebra 1 Chapter 10 Review Spring 2015

ROUND ALL DECIMAL ANSWERS TO THE NEAREST HUNDREDTH unless noted otherwise.

1. For each quadratic equation state if the parabola opens Up or Down and if the vertex is a Max or a Min.

a) $y = -950x^2 + 58x + 108$ b) $y = 0.013x^2 + x - 75$

2. Use the letters to arrange these parabolas in order from Narrowest to Widest:

A. $y = -3x^2 + 9x - 1$ B. $y = 0.68x^2 - 4x + 19$ C. $y = -0.73x^2 - 8x + 2$

D. $y = 5x^2 - 9x + 12$ E. $y = -9x^2 + 8x - 1$

3. The Vertex of a parabola is $(-1.3, 7.6)$. Write the equation for the Line of Symmetry.

4. $x = -2$ is the equation of the Line of Symmetry for the quadratic: $y = 3x^2 + 12x - 10$. State the coordinates of the Vertex.

5. For each quadratic, find the equation for the Line of Symmetry

a) $y = 6x^2 + 24x - 5$ b) $y = -2x^2 - 8x + 7$ c) $y = 4x^2 - 5$ d) $y = 5x^2 - 9x$

6. For each quadratic find the coordinates of the Vertex.

a) $y = x^2 - 8x + 1$ b) $y = -4x^2 + 16x - 21$ c) $y = 2x^2 + 14x$ d) $y = -7x^2 + 3$

7. For each quadratic find the y-intercept.

a) $y = 4x^2 + 8x - 9$ b) $y = 3x^2 + 5$ c) $y = -x^2 + 6x$

8. Graph each parabola using five points. Make sure you show the Line of Symmetry and the Vertex.

a) $y = 3x^2 + 18x + 21$ b) $y = -x^2 + 2x + 3$ c) $y = 2x^2 - 5$

9. A ball is shot into the air with an initial velocity of 120 ft/sec from a height of 50 feet. The following equation models the height of the ball as a function of time: $h(t) = -16t^2 + 120t + 50$

a) Find the time it takes the ball to reach its maximum height.
b) Find the maximum height of the ball.
c) Find the time it takes the ball to return to the ground.
d) Find the time it takes the ball to reach a height of 100 feet.

10. The cost to manufacture a certain part is a function of how many parts are produced. The following equation models the cost C of making p parts. $C(p) = 60p^2 - 4800p + 150,000$

a) How many parts should be manufactured in order to minimize the cost?
b) What is the minimum cost?

11. Simplify each radical. a) $\sqrt{54}$ b) $\sqrt{150}$ c) $\sqrt{112}$ d) $\sqrt{108}$ e) $\sqrt{343}$

12. Find each to the nearest hundredth.

a) $-\sqrt{46}$ b) $\pm\sqrt{111}$ c) $\sqrt{901}$

13. Find the square roots of 676.

14. Write an equation and solve it for each given situation.

a) The area of a square is 1047 cm^2. Find the length of each side to the nearest tenth.

b) The area of a circle is 76 in^2. Find the radius to the nearest hundredth.

15. Find the solutions to each quadratic equation by using square roots.

Round irrational roots to the nearest hundredth when needed.

a) $5x^2 - 80 = 0$ b) $38 - 2x^2 = 4$

Simplify irrational roots when needed.

c) $7w^2 - 141 = w^2 + 3$ d) $3 - 2x^2 = 63$

16. Find the solutions to each equation.

a) $(x-9)(x+4) = 0$ b) $6x(4x-7)(x+3) = 0$ c) $8(6x+1)(2x-5) = 0$

17. Solve each quadratic equation by factoring.

a) $x^2 - 4x = 12$ b) $16x^2 + 24x = 0$ c) $2x^2 - 18x + 40 = 0$ d) $6x^2 + 23x + 20 = 0$

18. Use the discriminant , $b^2 - 4ac$, to tell if each quadratic equation has NONE, ONE, or TWO real solutions.

a) $4x^2 + 8x + 5 = 0$ b) $-2x^2 - 5x + 8 = 0$ c) $x^2 + 2x - 9 = 0$

d) $16x^2 - 8x + 1 = 0$ e) $-3x^2 - 2x - 4 = 0$

19. Solve each equation by using the quadratic formula. Round real solutions to the nearest hundredth.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

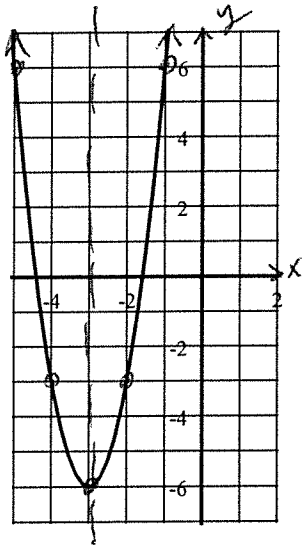
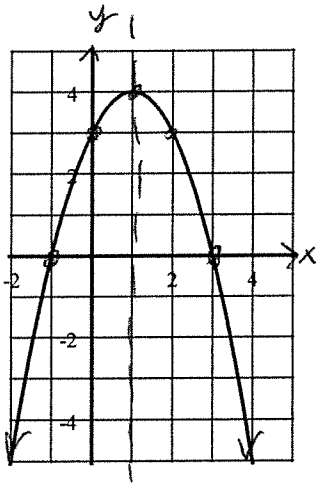
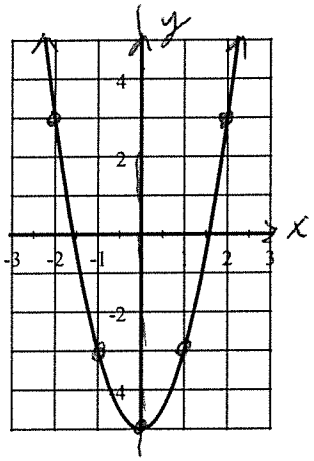
a) $x^2 + 32 = 13x$ b) $4x^2 - 28x + 49 = 0$

c) $5x^2 + 2x - 8 = 0$ d) $x^2 - 6x + 12 = 0$

20. Solve these four quadratic equations using the methods of Factoring, Square Roots, and Quadratic Formula at least once each.

a) $7x^2 + 5x - 8 = 0$ b) $6x^2 + 9x = 0$ c) $5x^2 + 2 = 17$ e) $2x^2 + 12x + 16 = 0$

1. a) Opens Down, Max b) Opens Up, Min
2. EDACB 3. LOS: $x = -1.3$ 4. $(-2, -22)$
5. a) $x = -2$ b) $x = -2$ c) $x = 0$ d) $x = 0.9$
6. a) $(4, -15)$ b) $(2, -5)$ c) $(-3.5, -24.5)$ d) $(0, 3)$
7. a) -9 b) 5 c) 0
8. a) $y = 3x^2 + 18x + 21$ b) $y = -x^2 + 2x + 3$ c) $y = 2x^2 - 5$

9. a) 3.75 sec b) 275 ft c) 7.90 sec d) 0.44sec and 7.06 sec
10. a) 40 parts b) min cost is 54,000
11. a) $3\sqrt{6}$ b) $5\sqrt{6}$ c) $4\sqrt{7}$ d) $6\sqrt{3}$ e) $7\sqrt{7}$
12. a) -6.78 b) ± 10.54 c) 30.02
13. ± 26
14. a) EQ: $1047 = x^2$ x = length of a side of the square. $x = 32.4\ cm$
    b) EQ: $76 = \pi r^2$ r = length of the radius. $r = 4.92\ in$
15. a) $x = \pm 4$ b) $x = \pm 4.12$
    c) $w \pm 2\sqrt{6}$ d) No Real Sol

16. a). $x = 9, -4$ b) $x = 0, \frac{7}{4}, -3$ c) $x = -\frac{1}{6}, \frac{5}{2}$
17. a) Factors: $(x+2)(x-6)$ Sol: $x = -2, 6$ b) Factors: $8x(2x+3)$ Sol: $x = 0, -\frac{3}{2}$
    c) Factors: $2(x-4)(x-5)$ Sol: $x = 4, 5$ d) Factors: $(2x+5)(3x+4)$ Sol: $x = -\frac{5}{2}, -\frac{4}{3}$

18. a) None b) Two c) Two d) One e) None

19. a) $x = 3.30, 9.70$ b) $x = 3.5$ c) $x = -1.48, 1.08$ d) No Real Sol

20. First solve c) using square roots. c) $x = \pm 1.73$
    Next Solve b) using factoring: b) $6x^2 + 9x = 3x(2x+3) = 0$ $x = 0, -\frac{3}{2}$
    Try solving d) using factoring: d) $2x^2 + 12x + 16 = 2(x+4)(x+2)$ $x = -4, -2$
    Finally solve a) using Quadratic Formula: a) $x = -1.48, 0.77$