Algebra 2 Chapter 5 Review Fall 2013

Round decimals to the nearest hundredth unless noted otherwise. Give complex answers in standard form and with simplified radicals.

1. a) A company wants to minimize its costs. The following equation represents the company costs $C(e)$, in thousands of dollars, as a function of the number of employees e. $C(e) = 3e^2 - 96e + 870$. Find the number of employees that will minimize the company's costs and what those actual costs are.

b) An object is shot into the air from the top of a 50 foot building with an initial velocity of 144 ft/sec. The following equation models the objects height $h(t)$ as a function of the amount of time t (sec) after the launch. $h(t) = -16t^2 + 144t + 50$

i. Find the objects maximum height and the time it takes to reach that height.
ii. Find the amount of time it takes the object to come back down to the ground.
iii. Find the amount of time it takes the object to reach a height of 75 feet.

2. Solve this equation by graphing. Round to the nearest hundredth. $x^2 + 2x - 6 = x + 1$

Use these quadratic functions for problems 3 and 4

A $y = -33x^2 - 4x + 60$ B $y = 0.0042x^2 + 8x - 57$ C $y = -x^2 + 2x - 12$

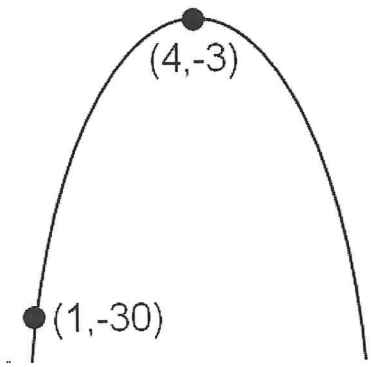
3. Does each parabola open up or down?

4. Is each vertex a maximum or a minimum?

5. For each quadratic find the following:
>Equation for the LOS
>Coordinates of the vertex
>y-intercept

a) $y = 2x^2 + 16x - 9$ b) $y = 4(x+3)^2 - 7$ c) $y = x^2 + 6$ d) $y = -3x^2 + 12x$

6. Write the equation of the parabola shown below in Vertex Form.



For 7 and 8, graph each quadratic using five points.

7. $y = -x^2 - 4x + 2$ 8. $y = 2(x-1)^2 - 5$

For 9 to 18, factor each completely.

9. $12x^5 + 16x^3$ 10. $x^2 - 100$ 11. $16y^2 - 81$

12. $5m^2 - 45$ 13. $2x^3 + 26x^2 + 60x$ 14. $x^2 - 5x - 36$

15. $x^2 - 10x + 16$ 16. $2x^2 + 16x - 96$ 17. $7x^2 + 23x + 6$

18. $4x^2 - 15x + 14$

For 19 to 22, Solve by factoring.

19. $x^2 - 2x = 24$ 20. $4x^2 + 10x = 0$ 21. $3x^2 + 24x + 36 = 0$

22. $6x^2 - 25x - 9 = 0$

Solve using square roots. Give non-integer answers in simplified radical form.

23. $5x^2 - 14 = 146$ 24. $2x^2 + 103 = 23$ 25. $(x-2)^2 - 3 = 13$

For 26 to 28, find ALL solutions using the quadratic formula: $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Give real answers rounded to the nearest hundredth. Give complex answers in simplified radical form.

26. $x^2 - 6x - 10 = 0$ 27. $4x^2 - 20x + 25 = 0$ 28. $x^2 - 4x + 13 = 0$

For 29 to 33, simplify each.

29. $(-4 - \sqrt{-16}) - (8 + \sqrt{-121})$ 30. $2i(8 - 4i)$

31. $(4 - 5i)(2 - 3i)$ 32. $(7 - 3i)(7 + 3i)$ 33. $\sqrt{-252}$

34. Solve each by completing the square. Give non-integer answers in simplified radical form.

a) $x^2 + 6x = 5$ b) $x^2 - 8x + 41 = 0$

Algebra 2 Chapter 5 Review Fall 2013 Answers

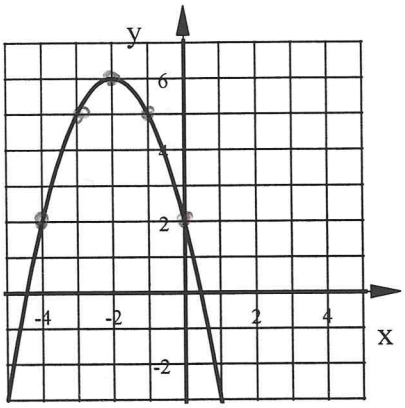
1. (a) # employees to min costs = 16. Minimum costs = 102 (which means $102,000)

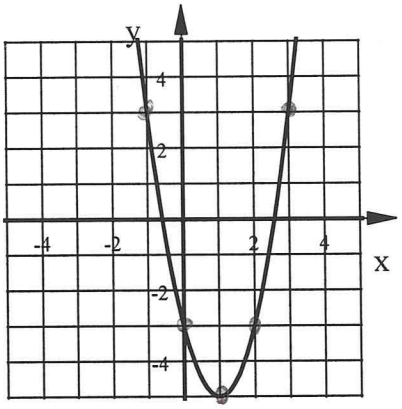
(b) i. Max height of 374 feet after 4.5 sec ii. The object will hit the ground after 9.33 sec
iii. The object will be 75 high two times, after 0.18 sec and 8.82 sec.

2. $x = x = -3.19, 2.19$ 3. A: Down B: Up C: Down 4. A: Max B: Min C: Max

6. $y = -3(x-4)^2 - 3$

7. $y = -x^2 - 4x + 2$ 8. $y = 2(x-1)^2 - 5$





9. $4x^3(3x^2+4)$ 10. $(x \pm 10)$ 11. $(4y \pm 9)$ 12. $5(m \pm 3)$

13. $2x(x+10)(x+3)$ 14. $(x+4)(x-9)$ 15. $(x-2)(x-8)$

16. $2(x+12)(x-4)$ 17. $(x+3)(7x+2)$ 18. $(4x-7)(x-2)$

19. $x = 6, -4$ 20. $x = -\frac{5}{2}, 0$ 21. $x = -2, -6$ 22. $x = \frac{9}{2}, -\frac{1}{3}$

23. $x = \pm 4\sqrt{2}$ 24. $x = \pm 2i\sqrt{10}$ 25. $x = -2, 6$

26. $x = -1.3589, 7.3589$ 27. $x = \frac{5}{2}$ 28. $x = 2 \pm 3i$

29. $-12 - 15i$ 30. $8 + 16i$ 31. $-7 - 22i$ 32. 58 33. $6i\sqrt{7}$

34. a) $x = -3 \pm \sqrt{14}$ b) $x = 4 \pm 5i$