Algebra II Chapter 5B Review

Test Review is due on the day of the test. Answers should be written on separate paper with graphs on graph paper. **** calculator allowed***

Solve the equation or formula for the indicated variable.

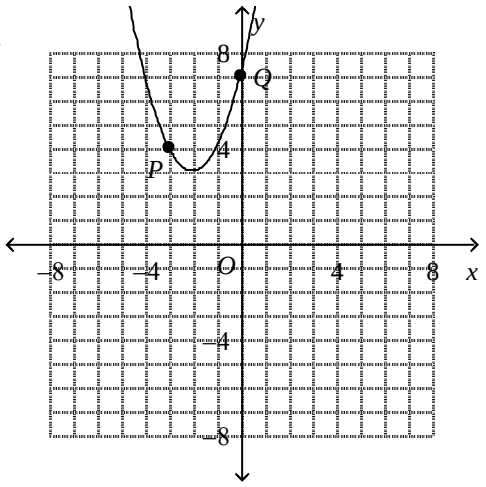
1. $S = 4r^2t$, for t

Find an equation for the line:

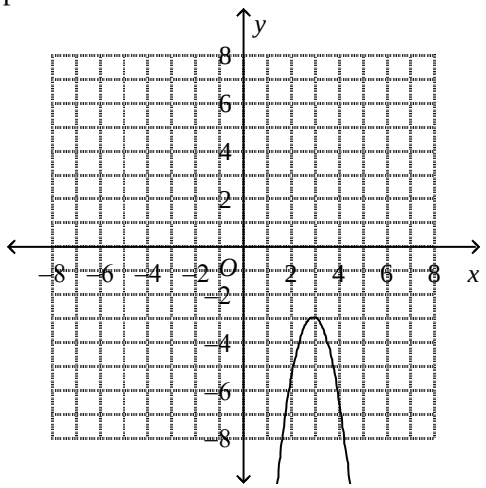
2. through (–6, –5) and parallel to $y = -\frac{3}{2}x - 4$.

Identify the vertex and the axis of symmetry of the parabola. Identify points corresponding to *P* and *Q*.

3.



4. Use vertex form to write the equation of the parabola



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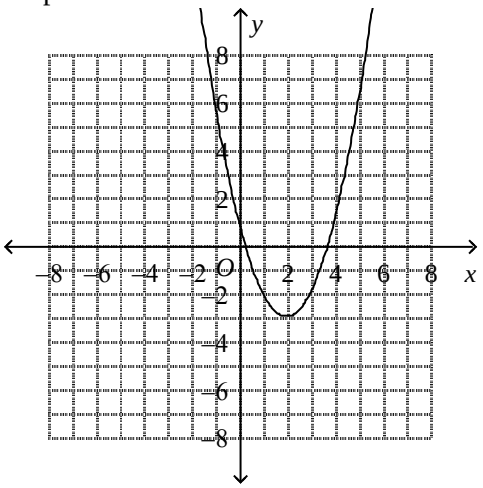


Solve by factoring. ***(this means fine "x"!!! Don't just factor.)***

6. $-12x^2 - 32x = 0$
7. $x^2 + 15x + 56 = 0$
8. $x^2 - 11x + 24 = 0$
9. $x^2 - 4x - 45 = 0$
10. $3x^2 + 35x + 72 = 0$
11. $9x^2 + 12x + 4 = 0$
12. $25x^2 - 64 = 0$

Solve the equation by finding square roots.

13. $6x^2 = -54$
14. $256x^2 = 36$

15. Solve by factoring. $4x^2 - 30x - 54 = 0$

*16. A Black and Decker determines that the number of shop vacs it can sell is given by the formula $V = -3p^2 + 162p - 320$, where p is the price of the shop vacs in dollars.
a. At what price will the manufacturer sell the maximum number of shop vacs?
b. What is the maximum number of shop vacs that can be sold?

*17. Bright Lights Light Bulb Company estimates that its weekly profit, P, in hundreds of dollars, can be approximated by the formula $P = -3x^2 + 6x + 7$, where x is the number of light bulbs produced per week, in thousands.
a. How many light bulbs should the company produce per week to earn the maximum profit?
b. Find the maximum weekly profit.

Find a quadratic model for the set of values.

*18. (–2, 9), (0, –3), (4, 69)

*19.

x	–2	0	4
$f(x)$	22	4	40

*20. The function $y = -16t^2 + 506$ models the height y in feet of a water balloon t seconds after it is dropped from the edge of a vertical cliff. How long will it take the water balloon to hit the ground? Round to the nearest hundredth of a second.

21. Find $|2 + 2i|$ 22. Find $|-3 - 2i|$.

Simplify the expression.

23. $(-1 - 4i) + (3 - 6i)$ 24. $(3 - i) - (-5 + 6i)$ 25. $(-5i)(-3i)$

26. $(-4 - 6i)(4 + 6i)$ 27. $(3 + 6i)(4 + 6i)$

28. Find the missing value to complete the square.
$x^2 + 16x +$ _____

Solve the quadratic equation by completing the square.

29. $x^2 + 14x + 47 = 0$ 30. $x^2 + 10x + 31 = 0$

*31. The function $P = -h^2 + 60h - 400$ models the daily profit a barbershop makes from haircuts that include a shampoo. Here P is the profit in dollars, and h is the price of a haircut with a shampoo. Write the function in vertex form. Use the vertex form to find the price that yields the maximum daily profit and the amount of the daily profit.

Use the Quadratic Formula to solve the equation.

32. $2x^2 - x - 3 = 0$ 33. $-5x^2 - 7x + 2 = 0$ 34. $-3x^2 - 5x - 8 = 0$

35. Graph $y = 2x^2 + 8x + 12$. What is the minimum value of the function?

36. Graph $y = -3x^2 + 6x + 5$. What is the minimum value of the function?

37. Graph $y = (x + 2)^2 - 3$.

38. Use the graph of $y = (x - 3)^2 + 5$.
a. If you translate the parabola to the right 2 units and down 7 units, what is the equation of the new parabola in vertex form?
b. If you translate the original parabola to the left 2 units and up 7 units, what is the equation of the new parabola in vertex form?

39. Simplify $\sqrt{-27}$ using the imaginary number *i*. 40. Simplify $\sqrt{-45}$ using the imaginary number *i*.

____ 41. Graph the complex number $-3 - 2i$

42. A biologist took a count of the number of Spotted Chorus Frogs at a particular lake, and recounted the lake's population of frogs on each of the next six weeks.

Week	0	1	2	3	4	5	6
Population	585	582	629	726	873	1,070	1,317

a. Find a quadratic function that models the data as a function of *x*, the number of weeks.
b. Use the model to estimate the number of frogs at the lake on **week 8**.

Algebra II Chapter 5B Review Answer Section

1. $t = \frac{S}{4r^2}$ **2.** $y = -\frac{3}{2}x - 14$ **3.** (–2, 3); $x = -2$; $P'(-1, 4)$; $Q'(-4, 7)$ **4.** $y = -3(x - 3)^2 - 3$

5. $y = (x - 2)^2 - 3$ **6.** $-4x(3x + 8)$ **7.** $(x + 7)(x + 8)$ **8.** $(x - 8)(x - 3)$ **9.** $(x - 9)(x + 5)$

10. $(3x + 8)(x + 9)$ **11.** $(3x + 2)^2$ **12.** $(5x + 8)(5x - 8)$ **13.** $2, -2; \pm 3i$ **14.** $-\frac{3}{8}, \frac{3}{8}$ **15.** $9, -\frac{3}{2}$

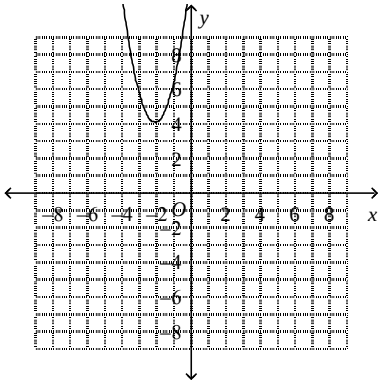
16. \$27; 1,867 **17.** 1,000 units; \$1000 **18.** $y = 4x^2 + 2x - 3$ **19.** $y = 3x^2 - 3x + 4$ **20.** 5.62

21. $2\sqrt{2}$ **22.** $\sqrt{13}$ **23.** $2 - 10i$ **24.** $8 - 7i$ **25.** –15 **26.** $20 - 48i$ **27.** $-24 + 42i$ **28.** 64

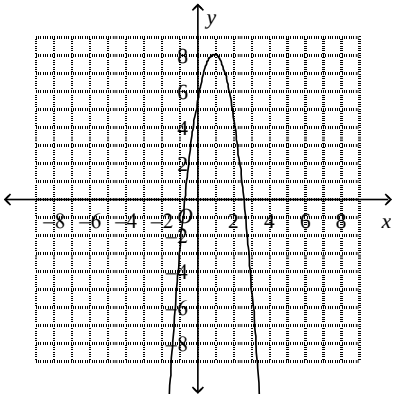
29. $-7 \pm \sqrt{2}$ **30.** $-5 \pm i\sqrt{6}$ **31.** $P = -(h - 30)^2 + 500$; \$30; \$500

32. $\frac{3}{2}, -1$ **33.** $-\frac{7}{10} \pm \frac{\sqrt{89}}{10}$ **34.** $-\frac{5}{6} \pm \frac{i\sqrt{71}}{6}$

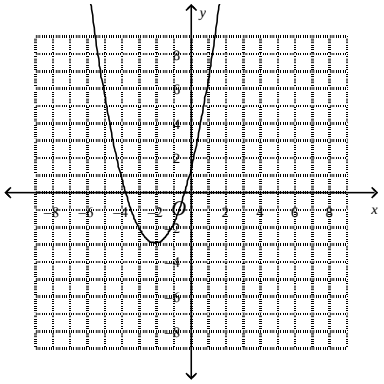
35. minimum: 4



36. maximum value; 8



37.



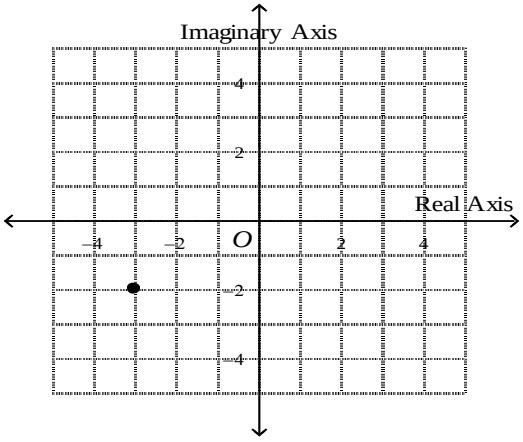
38. **a** . $y = (x - 5)^2 - 2$

b. $y = (x - 1)^2 + 12$

39. $\pm 3i\sqrt{3}$

40. $\pm 3i\sqrt{5}$

41.



42. $P(x) = 25x^2 - 28x + 585$; 1,961 frogs