

- 1 Write an equation for a parabola with vertex at $(0, -1)$ and one of its x -intercepts at $(2, 0)$.

Write your answer in the standard form.

- 2 Find the vertex of the graph of

$$y = -2x^2 + x + 3$$

- 3 Use the discriminant to determine how many x -intercepts the graph of the following equation has.

$$y = x^2 - 6x + 12$$

- 4 Find the vertex of the graph of

$$y = -3(x - 4)^2 + 8$$

Is the vertex a maximum or a minimum point of the graph?

- 5 Find the coordinates of the vertex and the intercepts.

$$y = -x^2 + -4x + 32$$

a. $(8, 0), (4, 0); (0, -8); (-2, 36)$

b. $(8, 0); (-8, -32); (2, 36)$

c. $(-8, 0), (4, 0); (0, 32); (-2, 36)$

- 6 Find values for a , b , and c so that the graph of the parabola $y = ax^2 + bx + c$ includes the points $(-1, -1)$, $(2, 8)$, and $(-2, 4)$.

- 7 Find values for a , b , and c so that the graph

$$y = ax^2 + bx + c$$

includes the points $(-5, -83)$, $(2, -6)$ and $(4, -38)$.

a. $a = -3, b = 2$ and $c = 2$

b. $a = 1, b = -2$ and $c = -6$

c. $a = -1, b = -6$ and $c = -2$

- 8 The data below show Americans' annual per capita consumption of chicken for several years since 1970.

Age	Pounds of chicken
1970	26.8
1975	28.05
1980	31.3
1985	36.55
1989	42.19
1990	43.8
1991	45.49
1992	47.26

Use the values for 1970, 1985, and 1990 to fit a quadratic equation to the data, where t is measured in years since 1970.

$$C = at^2 + bt + c$$

a. $C = 0.04t^2 + 0.05t + 26.8$

b. $C = 0.04t^2 - 26.85t + 26.8$

c. $C = 0.002t^2 - 1.34t + 0.04$

- 9 You are driving at 60 miles per hour when you step on the brakes. Find a quadratic formula for the distance in feet that your car travels in t seconds after braking. Some data are provided.

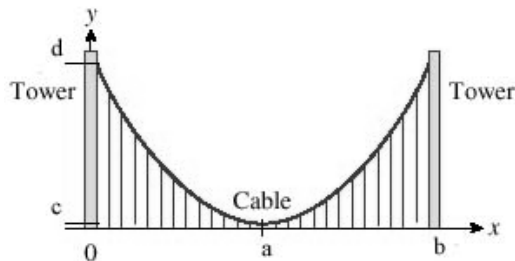
Seconds	1	2	3	4
Feet	89	153	237	341

a. $D = 10t^2 - 79t + 45$

b. $D = 10t^2 + 34t + 45$

c. $D = 340t^2 - 1530t + 10$

- 10 The cables on a suspension bridge hang in the shape of parabolas. Imagine a coordinate system superimposed on a diagram of a suspension bridge, as shown in the picture. Each of the towers is $d = 350$ feet high, and the span between the towers is $b = 3000$ feet long. At its lowest point, the cable hangs $c = 20$ feet above the roadway. Find the coordinates of the vertex.



a. (1500, 1520)

b. (1500, 20)

c. (3000, 350)

11 A company can produce x lawn mowers for a cost of

$$C = 0.125x^2 + 100000$$

dollars. The sale of the lawn mowers will generate

$$R = 300x$$

dollars in revenue. Find the break – even points by solving a system of equations.

12 Solve the following system algebraically.

$$\begin{aligned}y &= x^2 + 4x + 8 \\5y + 3x &= 7\end{aligned}$$

a. $(2, -10)$

b. $(-7, 5)$

c. $(-4, -5)$

d. $(4, -2)$

e. The system has no solution.

13 The Chamber of Commerce in River City wants to put on a Fourth of July fireworks display. City ordinance requires that fireworks at public gatherings explode at least 900 feet above the ground. The mayor particularly wants to include the Freedom Starburst model, which is launched from the ground so that its height after t seconds is given by

$$h = 360t - 20t^2$$

When should the Starburst explode in order to satisfy the safety ordinance?

14 Consider the graph of $y = x^2 - 36$. Find the solutions of

$$x^2 - 36 = 0$$

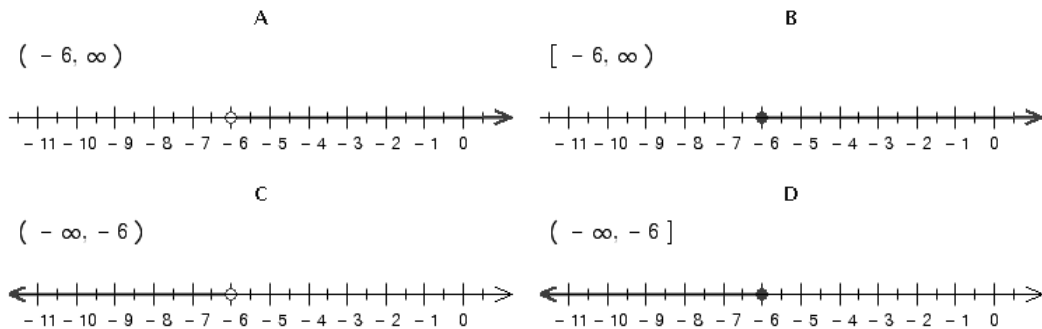
15 Consider the graph of $y = x^2 - 25$. Find the solutions of

$$x^2 - 25 > 0$$

16 Write the following solution set in interval notation, and graph the solution set on a number line.

$$x \geq -6$$

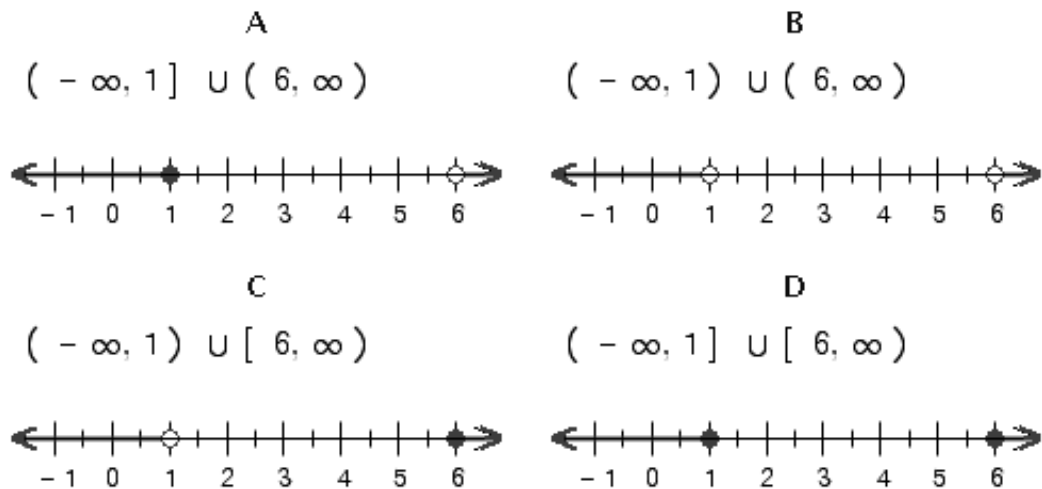
Select the label that corresponds to the correct answer.



17 Write the following solution set in interval notation, and graph the solution set on a number line.

$$x \leq 1 \text{ or } x > 6$$

Select the label that corresponds to the correct answer.



18 Write the set with interval notation.

$$-4 < x \leq 9$$

a. $(-\infty, -4) \cup [9, \infty)$

b. $(-4, 9]$

c. $(-\infty, -4] \cup (9, \infty)$

d. $[-4, 9)$

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19 Write the set with interval notation.

$$x < 5 \text{ or } 5 < x \leq 9$$

a. $(-\infty, 5) \cup (5, 9]$

b. $(-\infty, 9)$

c. $(-\infty, 5) \cup (5, 9)$

d. $(-\infty, 9]$

20 Graph the parabola $y = 63 - 2x - x^2$. Then use the graph to solve the inequality. Write your answers with interval notation.

$$63 - 2x - x^2 \leq 0$$

a. $(-9, 7)$

b. $(-\infty, -9] \cup [7, \infty)$

c. $(-\infty, -9) \cup (7, \infty)$

d. $[-9, 7]$

ANSWER KEY

Review ch4

- | | | | | |
|-----------------------------------|---------------------------------|-----------|-----------------------|---------------------|
| 1. $y = \frac{1}{4}x^2 - 1$ | 2. $(\frac{1}{4}, \frac{3}{8})$ | 3. zero | 4. (4, 8),
maximum | 5. c |
| 6. $y = 2x^2 + 1x - 2$ | 7. a | 8. a | 9. b | 10. b |
| 11. (400, 120000), (2000, 600000) | 12. e | 13. 3, 15 | 14. - 6, 6 | 15. $x < -5, x > 5$ |
| 16. B | 17. A | 18. b | 19. a | 20. b |