

Select the best choice to answer each question.

- For the function $y = -x^2 - 6x - 7$, find the vertex and axis of symmetry.
 - vertex (3, -2); axis of symmetry $x = 3$
 - vertex (-3, 2); axis of symmetry $x = 4$
 - vertex (-3, 2); axis of symmetry $x = -3$
 - vertex (3, -2); axis of symmetry $x = -4$
- If the graph of $y = ax^2 + bx + c$ opens down, which of the following must be true?
 - $a < 0$
 - $a > 0$
 - $c < 0$
 - $c > 0$
- Which function does *not* have a maximum value?
 - $y = -x^2 - 5x - 6$
 - $y = -x^2 - x - 6$
 - $y = 3x^2 - 15x + 2$
 - $y = 49 - x^2$
- What is the vertex of $y = -3(x - 2)^2 - 4$?
 - (-2, -4)
 - (-2, 4)
 - (2, -4)
 - (2, 4)
- What are the x-intercepts of $y = -2(x - 7)(x + 2)$?
 - 7 and 2
 - 7 and -2
 - 14 and -4
 - 14 and -2
- Factor the expression $m^2 - 4m - 21$.
 - $(m - 7)(m - 3)$
 - $(m - 7)(m + 3)$
 - $(m + 7)(m - 3)$
 - $(m + 7)(m + 3)$
- What are the roots of the equation $z^2 + 11z - 42 = 0$?
 - 3, -14
 - 3, -14
 - 3, 14
 - 3, 14
- Simplify the expression $\frac{2}{2 + \sqrt{3}}$.
 - $\frac{4}{13}$
 - 2
 - $4 - 2\sqrt{3}$
 - $\frac{4 - 2\sqrt{3}}{-5}$

9. What are the solutions of $-3 - y^2 = 24$?

- a. $\pm 3\sqrt{3}$ b. $\pm 3i\sqrt{3}$ c. $\pm 9\sqrt{3}$ d. $\pm 9i\sqrt{3}$

10. What is the standard form of the expression $\frac{i}{2+i}$?

- a. $\frac{1}{2}i+1$ b. $\frac{2}{3}i-1$ c. $\frac{i}{2}+1$ d. $\frac{2}{5}i+\frac{1}{5}$

11. What is the simplified form of $\frac{8a^2bc^{-1}}{12ab^3c}$?

- a. $\frac{2ab^2c^2}{3}$ b. $\frac{2a}{3b^2c^2}$ c. $\frac{2a}{3b^2}$ d. $\frac{2a}{3bc}$

12. What is the degree of the polynomial $h(t) = -8t^2 + 5 - 3t^3$?

- a. 1 b. 2 c. 3 d. 4

13. What is the complete factorization of $3x^4 - 3x^2$?

- a. $3x^2(x^2 - 1)$ b. $3x^2(x - 1)(x + 1)$
c. $3x(x - 1)(x + 1)$ d. $2(x^4 - x^2)$

14. If $x + 3$ is a factor of $x^3 - x^2 - 17x - 15$, what is another factor?

- a. $x + 1$ b. $x - 1$ c. $x + 5$ d. $x - 3$

15. What is the value of $(-243)^{3/5}$?

- a. -27 b. -3 c. 3 d. 27

16. What is the solution to $3x^5 + 350 = -379$?

- a. $-\frac{729}{\sqrt[5]{3}}$ b. -3 c. 3 d. $\frac{729}{\sqrt[5]{3}}$

17. Which expression is the simplest form of $4\sqrt[3]{32} - \sqrt[3]{32}$?

- a. $3\sqrt[3]{4}$ b. $6\sqrt[3]{4}$ c. 6 d. $16\sqrt[3]{2} - 4$

18. If $h(t) = t^{2/3} - 9$ and $j(t) = 3t + 5t^{2/3}$, what is $h(t) - j(t)$?

- a. $-4t^{2/3} - 3t - 9$ b. $4t^{2/3} + 3t + 9$
c. $3t + 6t^{4/3}$ d. $-7t^{7/3} - 9$

19. What is $g(f(x))$ if $f(x) = 3x^2$ and $g(x) = 2x^{1/2}$?

- a. $x\sqrt{6}$ b. $2x\sqrt{3}$ c. $6\sqrt{x}$ d. $6x$

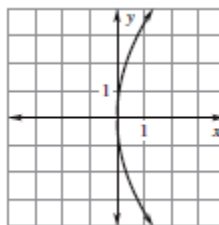
20. What is (are) the solution(s) to $x - 2 = \sqrt{2x - 1}$?

- a. $x = 1$ b. $x = 5$ c. $x = 1$ and 5 d. no solution

21. What is the distance between $(-2, 1)$ and $(7, -3)$?

- a. $\sqrt{13}$ b. $\sqrt{29}$
c. $\sqrt{65}$ d. $\sqrt{97}$

22. What is the focus of the graph shown?



- a. $(0, -3)$ b. $(0, 3)$
c. $(-3, 0)$ d. $(3, 0)$

23. What is the standard form of the parabola with directrix $x = -2$ and vertex $(0, 0)$?

- a. $y^2 = -8x$ b. $x^2 = -2y$ c. $x^2 = 2y$ d. $y^2 = 8x$

24. What is the equation of the parabola with vertex at (1,-5) and directrix $y = -2$?

a. $x - 1 = 12(y + 5)^2$

b. $x + 1 = 12(y - 5)^2$

c. $(x - 1)^2 = -12(y + 5)$

d. $(y + 5)^2 = -12(x - 1)$

25. Which ordered pair is a solution of the system of equations shown?

$$\begin{aligned} 2x^2 - 12x + y^2 - 54 &= 0 \\ y - 3x &= 5 \end{aligned}$$

a. (0,5)

b. (0,54)

c. (1,-8)

d. (1,8)

26. What is the radius of the circle $9x^2 + 9y^2 = 63$?

a. 1

b. $\sqrt{7}$

c. 7

d. 63

27. What is the radius of the circle $x^2 - 10x + y^2 + 4y - 20 = 0$?

a. 20

b. 7

c. 29

d. 49

28. An equation for a cross section of a flashlight's parabolic reflector can be modeled by $y^2 = 6x$. The light bulb is at the focus of the parabolic reflector. What is the focus?

a. $\left(\frac{3}{2}, 0\right)$

b. $\left(0, \frac{3}{2}\right)$

c. $\left(-\frac{3}{2}, 0\right)$

d.

$\left(0, -\frac{3}{2}\right)$

29. Which line is a line of symmetry for the parabola $(x - 1)^2 = 4(y - 1)$?

a. $y = 1$

b. $y = -1$

c. $x = 1$

d. $x = -1$

30. What is the vertex of the parabola $y = (x - 3)^2 + 8$?

a. (3, 8)

b. (-3, 8)

c. (-3, -8)

d. (3, -8)

1. c, 2. a, 3. c, 4. c, 5. b, 6. b, 7. b, 8. c, 9. b, 10. d, 11. b, 12. c, 13. b, 14. a, 15. a, 16. b, 17. b, 18. a,
19. b, 20. b, 21. d, 22. d, 23. d, 24. c, 25. d, 26. b, 27. b, 28. a, 29. c, 30. a