



Algebra I Proficiency Test Practice Questions

- Subtract and simplify $\frac{11}{14} - \frac{1}{2}$
a. $\frac{5}{6}$ **b. $\frac{2}{7}$** c. $\frac{5}{14}$ d. $\frac{7}{9}$
- Multiply $-5(x - 4y - 2)$
a. $-5x - 20y + 10$ b. $5x - 20y - 10$ **c. $-5x + 20y + 10$** d. $-5x + 20y - 10$
- Solve $y = \frac{u-x}{11}$ for u .
a. $u = 11y - x$ b. $u = \frac{x+y}{11}$ **c. $u = 11y + x$** d. $u = \frac{11x}{y}$
- Use the distance formula $d = r \times t$ to find the unknown value. $d = 143$ miles, $r = ?$, $t = 6.5$ hour
a. 24 mph b. 26 mph **c. 22 mph** d. 20 mph
- Solve $P = 2(l + w)$ for l .
a. $l = w + \frac{P}{2}$ **b. $l = \frac{P}{2} - w$** c. $l = \frac{P+w}{2}$ d. $l = \frac{P-w}{2}$
- Simplify $(-4x^3 - 2x^2 + 1) - (6x^3 + 9x^2 - 7)$
a. $-10x^3 + 7x^2 - 6$ b. $-10x^6 - 11x^4 - 6$
c. $2x^3 + 7x^2 + 8$ **d. $-10x^3 - 11x^2 + 8$**
- Simplify $7x^5 \cdot 9x^4$
a. $16x^9$ **b. $63x^9$** c. $63x^{20}$ d. $16x$
- Find the product: $(d + 8)(d - 8)$
a. $2d^2 - 64d$ **b. $d^2 - 64$** c. $d^2 - 16d - 64$ d. $d^2 + 16d + 64$
- Solve the equation: $(4 - x)(2x + 10) = 0$
a. $x = -5, x = 4$ c. $x = -5, x = -4$
b. $x = -10, x = 4$ d. $x = 5, x = -4$



10. . In which quadrant the point (8, -3) lie?

- a. Q IV b. Q II c. Q III d. Q I

11. Find the slope of the line perpendicular to $y = -\frac{4}{7}x + 5$

- a. $\frac{4}{7}$ b. $-\frac{4}{7}$ c. $\frac{7}{4}$ d. $-\frac{7}{4}$

12. Simplify: $\sqrt{50} + \sqrt{18}$

- a. $2\sqrt{8}$ b. $8\sqrt{2}$ c. $\sqrt{68}$ d. $35\sqrt{2}$

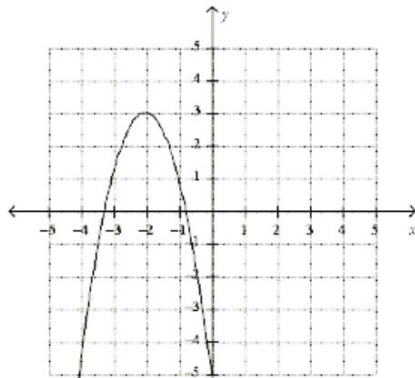
13. Factor $x^2 + 18x + 80$.

- a. $(x + 8)(x + 10)$ b. $(x + 18)(x + 80)$

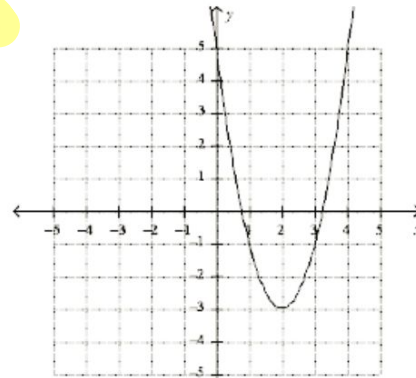
- c. $(x + 1)(x + 80)$ d. $(x + 5)(x + 16)$

14. Graph the quadratic function $y = 2(x - 2)^2 - 3$.

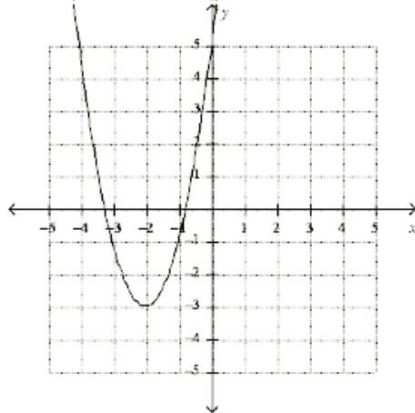
a.



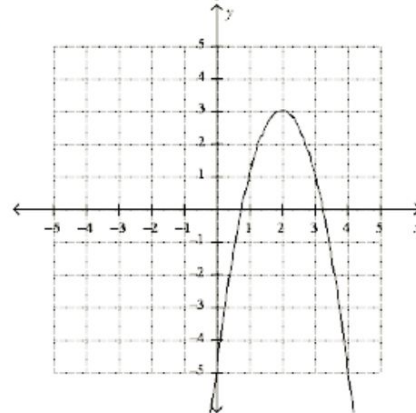
c.



b.



d.





15. How would you translate the graph of $y = -x^2$ to produce the graph of $y = -x^2 - 6$

- a. Translate the graph of $y = -x^2$ right 6 units
- b. Translate the graph of $y = -x^2$ up 6 units
- c. Translate the graph of $y = -x^2$ left 6 units
- d. Translate the graph of $y = -x^2$ down 6 units

16. Complete the square for $y = x^2 - 5x + \underline{\hspace{2cm}}$. Then write the resulting expression as a binomial squared.

- a. $\frac{25}{4}; (x + \frac{5}{2})^2$
- b. $-\frac{25}{4}; (x - \frac{5}{2})^2$
- c. $-\frac{25}{4}; (x + \frac{5}{2})^2$
- d. $\frac{25}{4}; (x - \frac{5}{2})^2$

17. Suppose the probability distribution is represented by a histogram. Furthermore, suppose you can draw a vertical line through a histogram that divides the histogram into two parts that are mirror images. Which word is used to describe the shape of the distribution?

- a. Binomial
- b. Random
- c. Skewed
- d. Symmetric

18. Sketch an example of a quadratic function with only one root. Parabola with one solution on axis. Answers may vary.

19. Sketch an example of a quadratic function with maximum value and whose discriminant is equal to zero. Parabola opening down with one solution on the axis.

20. Sketch a system of equations (One quadratic and one line) that has no solution. Parabola and line that never intersect.

21. Simplify $(5m^4n^5)(-2mn^2)(6m^2n^7)$. $-60m^7n^{14}$

22. Simplify $\frac{3}{3-\sqrt{6}}$. $3+\sqrt{6}$

23. Find the product $(4r + 3s)^2$. $16r^2 + 24rs + 9s^2$

24. Solve the equation. $(7x + 4)^2 = 64$ $x = -\frac{12}{7}, \frac{4}{7}$

25. The sum of the areas of two square lots is 832 square feet and the difference between their areas is 320 square feet. Find the lengths of each lot. $16 \text{ ft}, 24 \text{ ft}$

26. Factor.

- a. $x^2 + 2x - 48$
 $(x + 8)(x - 6)$
- b. $3x^2 + 11x + 10$
 $(3x + 5)(x + 2)$



27. Graph the following quadratic. Find and graph the vertex. Mark at least five points.

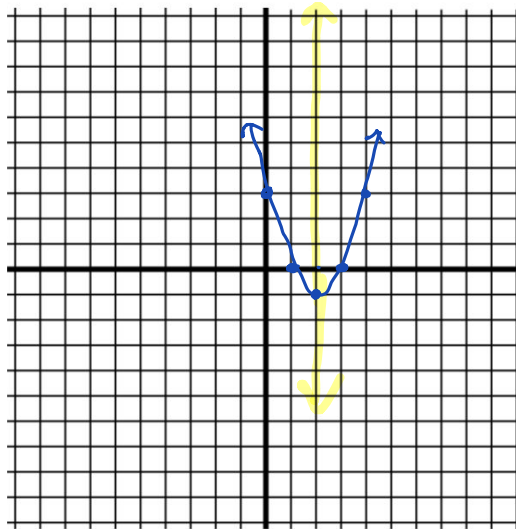
$$y = x^2 - 4x + 3$$

Does it open up or down?

How many roots? two

Highlight the axis of symmetry. Write the equation of the axis of symmetry.

$$x = 2$$



28. Multiply.

a. $(x-1)(x+1)$
 $x^2 - 1$

b. $(2x-7)^2$
 $4x^2 - 28x + 49$

c. $(2x-7)(3x^2-4x+5)$
 $6x^3 - 29x^2 + 38x - 35$

29. Factor completely.

a. $4x^2 - 24x - 28$
 $4(x-7)(x+1)$

b. $5x^2 - 45$
 $5(x-3)(x+3)$

c. $8x^3 + 24x^2 - 32x$
 $8x(x+4)(x-1)$

30. Rationalize.

a. $\frac{7}{3-\sqrt{2}} = 3+\sqrt{2}$

b. $\frac{5}{\sqrt{15}} = \frac{\sqrt{15}}{3}$

31. A person in the hot air balloon drops a sandwich over the edge from a height of 64 feet. The function $h = -16t^2 + 64$ represents the height h (in feet) of the sandwich after t seconds. How long does it take the sandwich to hit the ground?

$t = 2$ seconds



32. Find the inverse of the following functions.

a. $f(x) = 5x - 3$

$y = \frac{x+3}{5}$

b. $f(x) = -3x + 1$

$y = -\frac{1}{3}x + \frac{1}{3}$

33. Graph the following radical functions. Describe the domain and range of each. (Check graphs on calculator)

a. $y = \sqrt{2x}$

$D: \{x \geq 0\}, R: \{y \geq 0\}$

b. $y = \sqrt{x-2}$

$D: \{x \geq 2\}, R: \{y \geq 0\}$

34. Solve the following equations. Check for "Extraneous solutions".

a. $\sqrt{d+2} = 7$ 47

b. $\sqrt{m-4} - 8 = -3$ 29

c. $3\sqrt{x-1} = 24$ 65

35. Solve the following inequalities and graph.

a. $4x - 3 \geq -27$

$x \geq -6$ graphs should be on number line.

b. $-10 \leq x - 3 < -2$

$-7 \leq x < 1$

c. $|4x - 3| \geq 3$

$x \leq 0$ or $x \geq 1.5$

d. $|2x + 1| < 5$

$-3 < x < 2$

36. Solve $|3x - 4| + 3 = 8$. $\{-\frac{1}{3}, 3\}$

37. Solve. $\frac{4}{7}x - 30 = -2$ $x = 49$

38. Solve the equation. $8x + 15 = 12x - 45$ $x = 15$

39. Solve the equation. $7(2x + 3) - 8 = 4(3x - 5) + 2x + 16$ No solution.

40. Solve the following system of equations.

a. $4x + 3y = -7$

$-6x - y = 0$

$(\frac{1}{2}, -3)$

b. $y = 2x - 2$

$y = x^2 + 9x + 10$

$(-4, -10)$ $(-3, -8)$