

Algebra Review Questions

This practice test is a sampling of algebra review problems and is not intended to cover all topics for any particular assessment or course.

- Factor completely. $6x^5 + 10x^4 - 56x^3$
 - $2x^3(x + 4)(3x - 7)$
 - $2x^3(x - 7)(3x + 4)$
 - $(2x - 7x^2)(3x^4 + 8x)$
 - $(3x^3 - 2x^2)(2x^2 + 28x)$
- Factor completely. $14x^3 - 21x^5$
 - $-7x^3(3x^2 + 2)$
 - $-7x^3(3x^2 - 2)$
 - $7x^3(3x^2 - 2)$
 - $-7x(3x^4 - 2)$
- Factor completely. $25x^2 - 36$
 - $(5x - 6)(5x - 6)$
 - $(25x + 12)(x - 3)$
 - $(5x - 6)(5x + 6)$
 - $(25x - 9)(x + 4)$
- In what quadrant is the point $(-1.3, 4.2)$ located?
 - I*
 - II*
 - III*
 - IV*
- Evaluate $|r + 3s| - |s^2 - r|$ for $r = -4$ and $s = 3$.
 - 8
 - 0
 - 18
 - 8
- Evaluate $\frac{x}{5} + \frac{6-x}{3}$ for $x = 7$.
 - $\frac{3}{2}$
 - $\frac{26}{15}$
 - $\frac{16}{15}$
 - $-\frac{16}{15}$

7. Evaluate $\frac{x-y^2}{y+x^2}$ for $x = -2$ and $y = 7$.

- a. $-\frac{51}{3}$
- b. $\frac{51}{11}$
- c. $-\frac{51}{11}$
- d. $\frac{47}{3}$

8. Find the domain for the function $f(x) = \frac{1}{\sqrt{x-5}}$.

- a. $\{x \mid x > 5\}$
- b. $\{x \mid x \geq 5\}$
- c. $\{x \mid x \neq 5\}$
- d. $\{x \mid x > -5\}$

9. For the equation $y = 5x^3 - 4x^2 + 8$, find y when $x = -3$.

- a. -115
- b. -91
- c. -653
- d. -163

10. Calculate $(1 - 39 \div 3)^2 + 37 - 4$.

- a. $193\frac{4}{9}$
- b. 177
- c. -111
- d. 185

11. Solve $x^2 - 5x = -6$.

- a. $\{-1, 6\}$
- b. $\{2, 3\}$
- c. $\{-2, -3\}$
- d. $\{1, -6\}$

12. Solve $6x^2 - 4x - 5 = 0$.

- a. $\left\{ \frac{-2 - \sqrt{34}}{6}, \frac{-2 + \sqrt{34}}{6} \right\}$
- b. $\left\{ \frac{2 - 2\sqrt{34}}{6}, \frac{2 + 2\sqrt{34}}{6} \right\}$
- c. $\left\{ \frac{2 - \sqrt{34}}{6}, \frac{2 + \sqrt{34}}{6} \right\}$
- d. No real solutions

13. Solve $A = \frac{1}{2}h(b_1 + b_2)$ for h .

a. $h = \frac{b_1 + b_2}{2A}$

b. $h = \frac{A}{2(b_1 + b_2)}$

c. $h = \frac{\frac{1}{2}A}{b_1 + b_2}$

d. $h = \frac{2A}{b_1 + b_2}$

14. Simplify $\frac{3x^2 - x - 4}{x^2 - 1}$.

a. $2x^2 - x + 4$

b. $x + 1$

c. $\frac{3x - 4}{x - 1}$

d. $\frac{3x + 4}{x - 1}$

15. For $g(x) = x + 3$ and $f(x) = x - 2$, find $g(x)$ when $f(x) = -4$.

a. $g(x) = 5$

b. $g(x) = -3$

c. $g(x) = -1$

d. $g(x) = 1$

16. The sum of the page numbers of two facing pages of a book is 17. If x is the smaller page number, write an equation that could be used to find for the page numbers.

a. $x + (x + 1) = 17$

b. $x + (17 - x) = 17$

c. $x + (x + 2) = 17$

d. $2x + x = 17$

17. A number is five more than twice another number, and the sum of the numbers is 32.

Find the square of the product of the two numbers.

a. 42,849

b. 4761

c. 207

d. 610

18. If the perimeter of a square is $8x$, find its area.

a. $4x$

b. $64x^2$

c. $64x$

d. $4x^2$

19. Solve $9 = \frac{x-3}{7x+8}$.
- $\frac{69}{64}$
 - $-\frac{11}{62}$
 - $-\frac{75}{62}$
 - $-\frac{75}{64}$
20. Solve $8^x = 25$.
- $x \approx 1.548$
 - $x \approx 0.646$
 - $x \approx 1.442$
 - $x = 3.125$
21. A rectangular picture frame has a length 4 inches longer than its width, w . If the dimensions are each increased by 1 inch, by how much is the area increased.
- $w^2 + 4$ inches
 - $2w + 5$ inches
 - $w^2 + 4w + 1$ inches
 - $w^2 + 6w + 5$ inches
22. A wallet contains 11 bills, some \$5.00, and some \$10.00 bills. The total value is \$80.00. Write an equation to find the number, x , of \$5.00 bills.
- $5x + 10x = 80$
 - $5x + 10(11 - x) = 80$
 - $5x + 10(x - 11) = 80$
 - $5(11 - x) + 10x = 80$
23. Write an expression symbolizing 8 less than the product of 5 and the reciprocal of a number x .
- $8 - \frac{5}{x}$
 - $8 - 5x$
 - $\frac{5}{x} - 8$
 - $\frac{x}{5} - 8$
24. The sum of two numbers is 8. Write an expression for twice the product of the two numbers if one number is x .
- $2x(8 - x)$
 - $2(8 + x)$
 - $2x(8 + x)$
 - $16x^2$

25. Four tests average to a grade of 75. If the fourth test grade was x , find an expression to represent the average of the first 3.
- $\frac{300 - x}{3}$
 - $\frac{3(x - 75)}{3}$
 - $\frac{3x - 75}{4}$
 - $\frac{300 - x}{4}$
26. In a triangle, angle A is three times as large as angle B , and angle C measures 5° more than sum of angles A and B . If angle B measures x degrees, write an expression for angle C .
- $3x + 5$
 - $4x + 5$
 - $8x + 5$
 - $3x^2 + 5x$
27. Let $x, y,$ and z represent the grades of a student for test one through three, respectively. If the third test counts twice as much as any one of the other tests, write an expression for the average of the three tests.
- $\frac{0.5(x + y) + z}{3}$
 - $\frac{2(x + y + z)}{3}$
 - $\frac{x + y + 2z}{3}$
 - $\frac{x + y + 2z}{4}$
28. What is the slope of the line $f(x) = -\frac{3}{5}x - \frac{12}{7}$?
- $\frac{12}{7}$
 - $-\frac{3}{5}$
 - $-\frac{12}{7}$
 - $\frac{5}{3}$
29. A rectangle has a width of 4 meters and a length of 9 meters. Find the length if the width is 5 meters, but the perimeter does not change.
- 26 meters
 - 11 meters
 - 8 meters
 - 16 meters

30. Solve $5 - 3(2x + 7) = 9(x - 4)$.
- $\frac{57}{10}$
 - $\frac{16}{15}$
 - $\frac{10}{15}$
 - $\frac{4}{3}$
31. If the first side of a pentagon measures 2 inches more than the second side, n ; the third side measures twice the second side; the fourth side measures 1 inch less than the second side; and the fifth side measures the sum of the first and second sides, write an expression to represent the perimeter of the pentagon.
- $7n + 3$
 - $6n + 3$
 - $5n + 3$
 - $7n + 5$
32. Solve $|x + 3| \geq 9$.
- $\{x \mid -12 \leq x \leq 6\}$
 - $\{x \mid x \leq -6 \text{ or } x \geq 12\}$
 - $\{x \mid x \leq -12 \text{ or } x \geq 6\}$
 - $\{x \mid -6 \leq x \leq 12\}$
33. The area of a triangle can be found using the formula, $A = \frac{1}{2}bh$. Write an expression for the height when the area is 90.
- $\frac{180}{b}$
 - $180b$
 - $\frac{45}{b}$
 - $45b$
34. A store marks up the price of a skirt by 14%. If the original price was \$50, find the new price.
- \$70
 - \$43
 - \$7
 - \$57

35. A coat is on sale for 25% off the original price. The sale price is \$54. Find the original price.
- \$67.50
 - \$72
 - \$75
 - \$79
36. 23 is what percent of 69?
- 300%
 - 30%
 - $33\frac{1}{3}\%$
 - 0.33%
37. \$600 is invested at 6.3% annual (simple) interest. After one year, how much money is in the account?
- \$652.00
 - \$978.00
 - \$663.42
 - \$637.80
38. Solve $x^2 + 2x - 15 \geq 0$.
- $\{x \mid x \leq -5 \text{ or } x \geq 3\}$
 - $\{x \mid x \leq -3 \text{ or } x \geq 5\}$
 - $\{x \mid -5 \leq x \leq 3\}$
 - $\{x \mid -3 \leq x \leq 5\}$
39. John drinks a gallon of milk in 5 days and Mike drinks a gallon in 7 days. To the nearest day, how long will it take them to drink the 3 gallons in their refrigerator?
- 10 days
 - 2 days
 - 9 days
 - 12 days
40. Jane canoed upstream in a river and returned downstream the same distance. The return trip rate increased by 2 m.p.h. It took 5 hours to make the trip upstream but only 2.5 hours to make the trip back downstream. Find the distance travelled each way.
- 10 miles
 - 11 miles
 - 12 miles
 - 8 miles

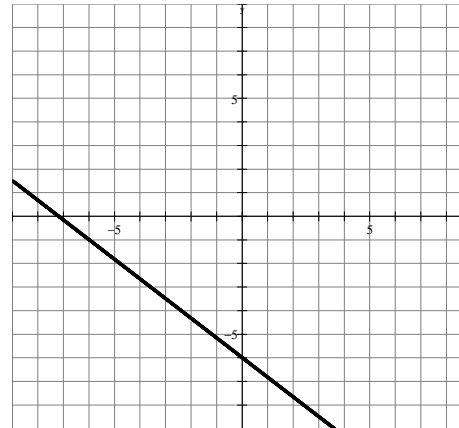
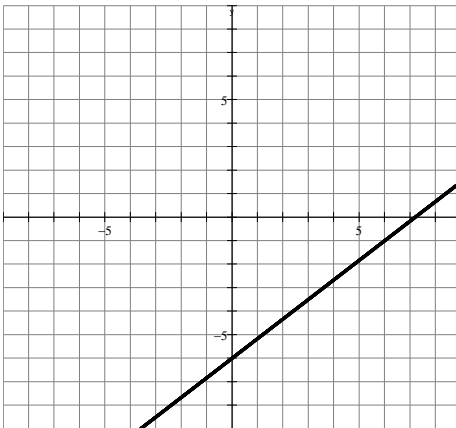
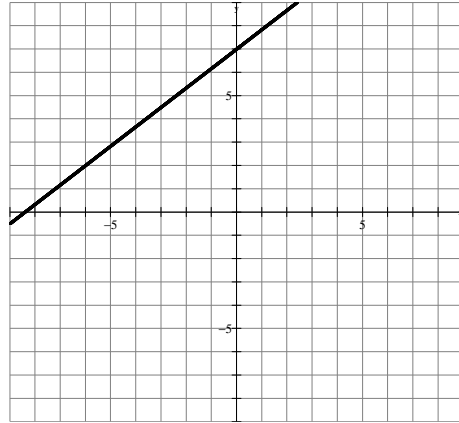
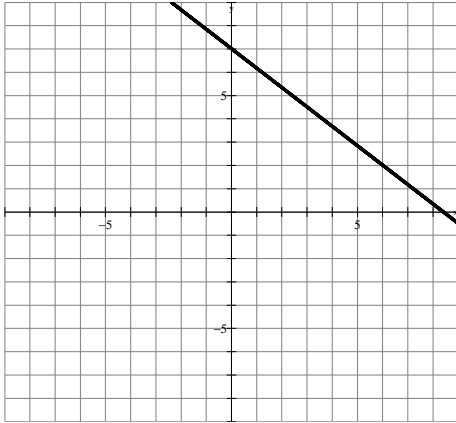
41. The stopping speed of a vehicle, x , varies directly with the square of speed, r , at which the vehicle is travelling. Express this as a formula where k is the constant of variation.
- $x = \frac{k}{r^2}$
 - $x = kr^2$
 - $x^2 = \frac{r^2}{k}$
 - $x^2 = kr$
42. The square of the hypotenuse of a right triangle, c , is equal to sum of the squares of the legs, a and b . Write this as a formula.
- $c^2 = (a + b)^2$
 - $c^2 = a^2 + b^2$
 - $c^2 = a^2b^2$
 - $2c = 2a + 2b$
43. Two trains leave at the same time each from different cities on the same track headed toward each other. The first is travelling 15 m.p.h. faster than the second, and the cities are 100 mile apart. The second train can make the entire trip in 2 hours. To the nearest minute, how long will it take for them to collide?
- 50 minutes
 - 45 minutes
 - 47 minutes
 - 52 minutes
44. How many quarts of cream containing 23% fat must be added to 10 quarts of milk containing 2% fat to produce milk that contains 7% fat?
- $3\frac{1}{8}$ quarts
 - $2\frac{2}{5}$ quarts
 - $4\frac{1}{7}$ quarts
 - $1\frac{3}{8}$ quarts
45. An automobile radiator contains 4 gallons of a mixture of 13% antifreeze and water. How much of the mixture must be replaced by antifreeze to bring the mixture up to 20% antifreeze.
- 0.32 gallon
 - 0.35 gallon
 - 0.42 gallon
 - 0.51 gallon

46. For an edge of length s , the volume of a cube is $V = s^3$. Assuming $n > 3$, represent the volume of a cube having each edge equal to 3 less than n .
- $n^3 - 27$
 - $(n - 3)^3$
 - $n^3 - 9$
 - $(3 - n)^3$
47. Find the x -intercept and y -intercept for the line $y = \frac{3}{4}x - 5$.
- $(-\frac{4}{3}, 0), (0, 5)$
 - $(\frac{3}{4}, 0), (0, -5)$
 - $(-5, 0), (0, \frac{20}{3})$
 - $(\frac{20}{3}, 0), (0, -5)$
48. Find the slope for the line $2x + 3y = 6$.
- 2
 - $-\frac{2}{3}$
 - $\frac{2}{3}$
 - $\frac{3}{2}$
49. Find the slope of a line perpendicular to the line $y = -\frac{2}{5}x - 7$.
- $\frac{1}{7}$
 - $-\frac{2}{5}$
 - $\frac{5}{2}$
 - $-\frac{5}{2}$
50. Find the slope and the y -intercept of the line $y = 5x - 8$.
- 8, $(0, -5)$
 - 8, $(0, 5)$
 - 5, $(-8, 0)$
 - 5, $(0, -8)$
51. Find the line that contains the point $(4, -5)$.
- $y = \frac{x}{4} - 5$
 - $y = 4x - 5$
 - $y = -3x + 4$
 - $y = 2x - 13$

52. Write the slope-intercept equation for the line that passes through the points $(-5, 6)$ and $(-10, -4)$.

- a. $y = -5x - 19$
- b. $y = 2x + 16$
- c. $y = -10x - 4$
- d. $y = -2x - 4$

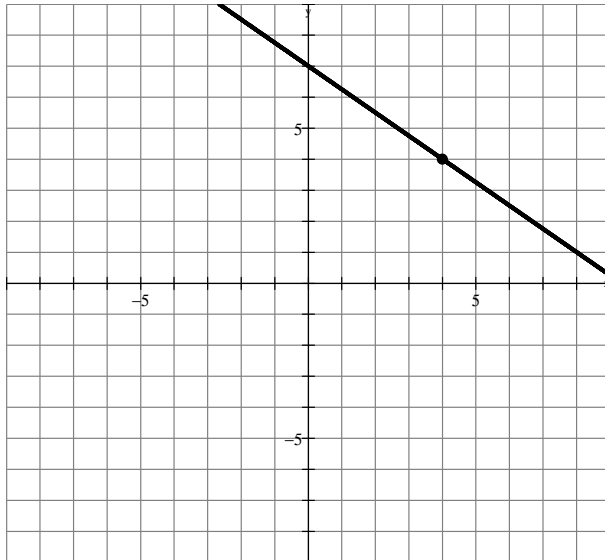
53. Graph $y = -\frac{5}{6}x + 7$.



54. Write the slope-intercept equation for the line that passes through the point $(6, -2)$ and is parallel to the line $y = -\frac{6}{7}x - 1$.

- a. $y = \frac{7}{6}x + 5$
- b. $y = \frac{7}{6}x - \frac{50}{7}$
- c. $y = -\frac{6}{7}x - 2$
- d. $y = -\frac{6}{7}x + \frac{22}{7}$

55. Write the equation for the line graphed below.



- a. $y = -\frac{3}{4}x + 7$
- b. $y = \frac{4}{3}x + 9$
- c. $y = \frac{3}{4}x - 7$
- d. $y = -\frac{3}{4}x + 9$

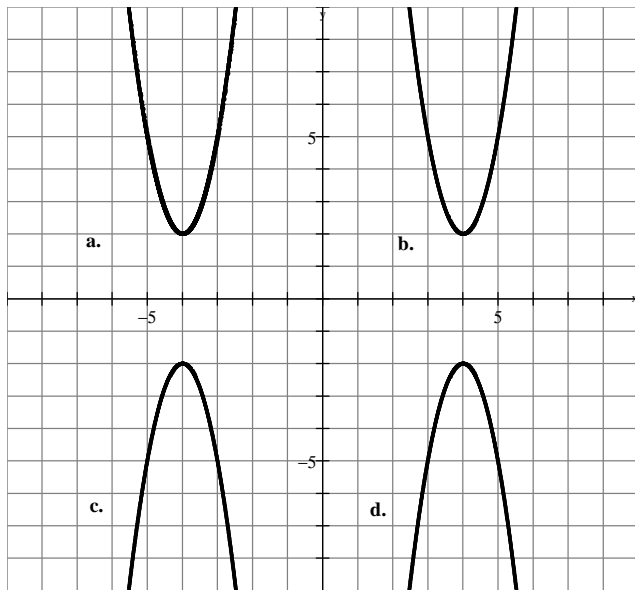
56. For $2x - 7y = 11$, find y when $x = -3$.

- a. $\frac{5}{7}$
- b. -5
- c. $-\frac{17}{7}$
- d. $-\frac{5}{7}$

57. A recipe calls for 3 cups flour, and $2\frac{1}{2}$ cups of sugar. To maintain the same ratio, how much sugar is needed if the flour is increased to 4 cups?

- a. $3\frac{1}{2}$ cups
- b. $2\frac{2}{3}$ cups
- c. $3\frac{2}{3}$ cups
- d. $3\frac{1}{3}$ cups

58. Choose the graph of $y = 3(x + 4)^2 + 2$.



59. Which type of function has a graph that is the shape of the letter V?

- a. quadratic
- b. linear
- c. absolute value
- d. cubic

60. Write an equation that shifts the graph $y = |x|$ up 2 units and right 5 units.

- a. $y = |x - 5| + 2$
- b. $y = |x + 5| + 2$
- c. $y = |x + 2| - 5$
- d. $y = |x - 2| + 5$

61. Solve $\log x = -3$.

- a. 0.001
- b. 300
- c. 1000
- d. 0.0001

62. Solve $\frac{x-5}{x+3} = \frac{x-4}{x+6}$.

- a. -5
- b. 9
- c. 1
- d. No solution

63. Solve $P = 2L + 2W$ for L .

- a. $L = \frac{1}{2}P - W$
- b. $L = P + W$
- c. $L = P - W$
- d. $L = P - 2W$

64. Factor $256t^2 - 352t + 121$.

- a. $(16 + 11)^2$
- b. $(16t + 11)(16t - 11)$
- c. $(16t - 11)^2$
- d. Not factorable

65. Simplify $(3r^3)^4$.

- a. $3r^{12}$
- b. $12r^7$
- c. $81r^7$
- d. $81r^{12}$

66. Find the midpoint of the line segment whose endpoints are $(-2, 5)$ and $(0, -6)$.

- a. $(-2, -1)$
- b. $(1, -\frac{11}{2})$
- c. $(-1, -\frac{1}{2})$
- d. $(-2, 2)$

67. Find the x -intercept and the y -intercept of the graph $12x + y = 7$.

- a. $(2, -17), (1, -5)$
- b. $(-12, 0), (0, 7)$
- c. $(7, 0), (0, -\frac{7}{12})$
- d. $(\frac{7}{12}, 0), (0, 7)$

68. Expand $(5r - \frac{2}{7})^2$.

- a. $25r^2 - \frac{20}{7}r + \frac{4}{49}$
- b. $25r^2 + \frac{4}{49}$
- c. $25r^2 - \frac{4}{49}$
- d. $25r^2 + \frac{20}{7}r - \frac{4}{49}$

69. Write an equation of the line containing the point $(0, -9)$ and perpendicular to the graph of $y = -\frac{1}{2}x + 3$.

- a. $y = 2x - 3$
- b. $y = -\frac{1}{2}x - 9$
- c. $y = 2x - 9$
- d. $y = -2x - 9$

70. Simplify $(3x^2 - 4x) - (2x^2 - 3)$.

- a. $x^2 - 7x$
- b. $x^2 - 4x - 3$
- c. $5x^2 - 4x - 3$
- d. $x^2 - 4x + 3$

71. Solve the system of equations. $\begin{cases} -7x + 2y = -11 \\ 5x + y = 20 \end{cases}$

- a. $(-\frac{9}{2}, \frac{-137}{2})$
- b. $(3, 5)$
- c. $(\frac{29}{3}, \frac{85}{3})$
- d. $(\frac{3}{4}, \frac{23}{8})$

72. For the equation $f(x) = 25x^2 - 120x + 396$, find x when $f(x) = 252$.

- a. $\frac{5}{24}$
- b. $\frac{12}{5}$
- c. $-\frac{12}{5}$
- d. 1,557,756

73. On a certain planet, a spaceship weighs 78% more than on Earth. If the weight of a spaceship is x on Earth, write an expression that represents the weight of the ship on the other planet.

- a. $x + 0.78$
- b. $0.22x$
- c. $0.78x$
- d. $1.78x$

74. Solve $|x - 3| < 8$.

- a. $\{x \mid -5 < x < 11\}$
- b. $\{x \mid -11 < x < 5\}$
- c. $\{x \mid -5 < x < 5\}$
- d. $\{x \mid x < -5 \text{ or } x > 11\}$

75. Find the distance between the points $(2, 3)$ and $(-4, -6)$.
- $\sqrt{13}$
 - $\sqrt{117}$
 - 15
 - 117
76. Determine the nature of the solution(s) of $17x^2 - 102x + 153 = 0$.
- One real solution
 - Two real solutions
 - Three real solutions
 - No real solutions
77. Find the slope for the line containing the points $(3, 2)$ and $(1, 9)$.
- $-\frac{7}{2}$
 - $-\frac{2}{7}$
 - $\frac{7}{2}$
 - $\frac{25}{2}$
78. Calculate $6\frac{2}{3} - 1\frac{4}{5}$.
- $5\frac{2}{15}$
 - $4\frac{13}{15}$
 - $4\frac{2}{15}$
 - $4\frac{2}{5}$
79. Simplify and add $\frac{3\sqrt{8}}{7} - \frac{\sqrt{18}}{5}$.
- $\frac{3\sqrt{-10}}{2}$
 - $\frac{3\sqrt{2}}{2}$
 - $\frac{9\sqrt{2}}{35}$
 - $-\frac{3\sqrt{2}}{35}$
80. Evaluate $3x\sqrt{5xy^2} - 5\sqrt{4x^3}$ for $x = 2$ and $y = -3$.
- $18\sqrt{10} - 20\sqrt{2}$
 - $54\sqrt{10} - 80\sqrt{2}$
 - $6\sqrt{-90} - 20\sqrt{2}$
 - $-2\sqrt{8}$