

Algebra Skills Assessment for incoming MLWGS students

No calculator permitted

Take no more than one hour 15 minutes (75 minutes)

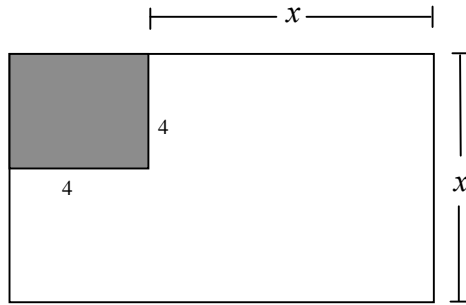
Submit answers to <http://www.quia.com/quiz/4179124.html>

Feel free to print this test and use scratch paper, but do not use a calculator.

Algebra Skills Assessment

1. Which of the following is true given $x < -1$?
- a) The additive inverse of x is less than x
 - b) The multiplicative inverse of x is less than x .
 - c) The multiplicative inverse of x is greater than the additive inverse of x .
 - d) The multiplicative inverse of x is greater than x .
 - e) None of these relationships can be determined with the given information.
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2. Which of the following is/are true given the line $y = -3x + 2$?
- a) The y -intercept is negative.
 - b) The x -intercept is negative.
 - c) The y coordinate of the y -intercept is less than the x coordinate of the x -intercept.
 - d) a) and b) are true, but c) is false
 - e) a), b), and c) are true.
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3. Which of the following is/are true given $y > 1$?
- a) $(y^3)^{100} = y^3y^{100}$
 - b) $(y^3)^{100} > y^3y^{100}$
 - c) $(y^3)^{100} < y^3y^{100}$
 - d) The relationship cannot be determined without more information.
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4. $\sqrt{5^2 + 4^2} =$
- a) 20
 - b) 9
 - c) 81
 - d) $\sqrt{41}$
 - e) undefined
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5. Expand $(3x + 1)^2(x + 2)$.
- a) $9x^3 + 18x^2 + x + 2$
 - b) $9x^3 + 18x^2 + x + 2$
 - c) $9x^3 + 2$
 - d) $9x^3 + 12x^2 + 11x + 2$
 - e) $9x^4 + 25x^2 + 4$
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6. A rectangle has a length of $(x + 3)$ and a width of $(3x^2 + 4x)$. What is its perimeter?
- a) $3x^3 - 5x^2 + 12x$
 - b) $3x^3 + 4x^2 + 3$
 - c) $3x^2 + 5x + 3$
 - d) $3x^3 + 12x$
 - e) $6x^2 + 10x + 6$

7. For what value of x will the area of the white region be equal to 29 square inches?



Match the polynomial with its factored form. Write the letter of the factored form in the blank.

- | | |
|-----------------------------|-----------------------|
| _____ 8. $6x^2 - 35x + 6$ | A) $(3x - 2)(3x + 2)$ |
| _____ 9. $6x^2 + 5x + 6$ | B) $(2x + 3)(3x - 2)$ |
| _____ 10. $6x^2 - 13x + 6$ | C) $(3x - 2)(3x - 2)$ |
| _____ 11. $9x^2 - 4$ | D) Prime |
| _____ 12. $9x^2 - 12x + 4$ | E) $6(x - 2)^2$ |
| _____ 13. $9x^2 + 4$ | F) $(6x + 1)(x - 6)$ |
| _____ 14. $6x^2 - 24x + 24$ | G) $6(x - 2)(x + 2)$ |
| _____ 15. $6x^2 + 24$ | H) $6(x^2 + 4)$ |
| _____ 16. $6x^2 - 24$ | I) $(2x - 3)(3x - 2)$ |

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17. The graphs of the equations $\begin{cases} x + 3y = 2 \\ 3x + 9y = 12 \end{cases}$ consist of:

- | | |
|---------------------------------------|---|
| a) two lines intersecting where $x=1$ | b) two lines intersecting where $x = \frac{2}{3}$ |
| c) two distinct parallel lines | d) only one line |
| e) two lines intersecting where $y=1$ | |

18. What is the slope of the line perpendicular to the line $3x + 5y + 8 = 0$?

- a) $\frac{3}{5}$ b) $\frac{5}{3}$ c) $-\frac{3}{5}$ d) $-\frac{5}{3}$ e) 3
-

19. If $R = \frac{ST}{S-T}$, then S =

- a) $\frac{RT}{T-R}$ b) $\frac{RT}{R-T}$ c) $\frac{RT}{T+R}$ d) $\frac{R+T}{RT}$ e) $\frac{R-T}{RT}$
-

20. If $x = 100$, find the value of $\sqrt{\frac{x}{16} - \frac{x}{25}}$.

- a) 15 b) 5 c) $\frac{5}{2}$ d) $\frac{3}{2}$ e) $\frac{1}{2}$
-

21. What is the slope of the line given by the equation $5x + 3y = 2$?

- a) $-\frac{5}{3}$ b) $-\frac{3}{5}$ c) 65 d) $\frac{5}{3}$ e) 5
-

22. What is an equation of the line passing through (3, 0) and (7, 5)?

- a) $y = \frac{4}{5}x + 3$ b) $y = \frac{4}{5}x + \frac{12}{5}$ c) $y = \frac{2}{3}x$
d) $y = \frac{5}{4}x - 3$ e) $y = \frac{5}{4}x - \frac{15}{4}$
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23. What is the equation of the horizontal line that goes through (6, 4)?

- a) $x = 4$ b) $x = 6$ c) $y = 4$ d) $y = 6$ e) $y = \frac{3}{2}x$

24. Given $f(x) = \sqrt{x-2} + \frac{3}{x}$, what is $f(6)$?

- a) 2.5 b) 3.5 c) 5.5 d) 6.5 e) 17.5
-

25. What is the equation of a line passing through (3, 2) that has undefined slope?

- a) $x = 2$ b) $x = 3$ c) $y = 2$ d) $y = 3$ e) No line exists
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26. What is the equation of a line passing through (3, 2) that has a slope equal to 0?

- a) $x = 2$ b) $x = 3$ c) $y = 2$ d) $y = 3$ e) No line exists
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For problems 27 – 34, solve for x . If more than one solution exists, separate your answers with commas. For example if $x = 2$ or 3, enter 2,3 as your answer.

27. $x^2 + 2x = 15$

$x =$ _____

28. $3(x + 2)^2 = 12$

$x =$ _____

29. $\frac{5}{2x+3} = \frac{3}{x}$

$x =$ _____

30. $\frac{3}{5}x - \frac{1}{4}x = 7$

$x =$ _____

$$31. 5[3 \div (x \div 2)] = x$$

$$x = \underline{\hspace{2cm}}$$

$$32. (x \div 3)(2x) = 0$$

$$x = \underline{\hspace{2cm}}$$

$$33. 2x^2 + 4x = 0$$

$$x = \underline{\hspace{2cm}}$$

$$34. \frac{1}{3}(5x+9) = -2$$

$$x = \underline{\hspace{2cm}}$$

True or False. Write the letter **T** if the statement is true for all values of x . Write the letter **F** if the statement is only true for some values of x or not true for any x .

$$35. (x)\left(\frac{1}{x}\right) = 1, \text{ where } x \neq 0.$$

$$36. x + -x = 1$$

$$37. x > |x|$$

$$38. -4(3-x) = 4x-12$$

$$39. \frac{x}{1+\frac{1}{3}} = \frac{4}{3}x$$

$$40. |x| = |-x|$$

$$41. -x < 0$$

Solve the system, enter your solution in problems 42 & 43:

$$\begin{cases} 4x - 3y = 5 \\ 3x + 2y = 8 \end{cases}$$

42. $x =$ _____

43. $y =$ _____

44. If $x = 3$, find the value of $\left(\sqrt{\frac{x^2}{16}}\right)\left(\sqrt{\frac{4x^2}{25}}\right)$

- a) $\frac{3}{10}$ b) $\frac{9}{10}$ c) $\frac{27}{100}$ d) $\frac{39}{20}$ e) $\frac{9}{5}$
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45. $\sqrt{125} + \sqrt{27} - \sqrt{12}$ is equal to

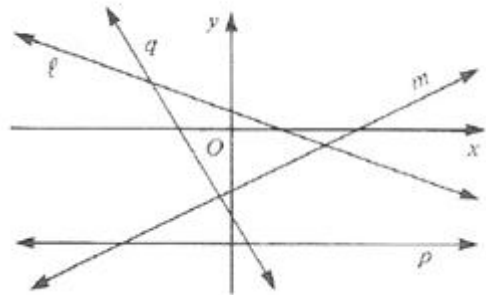
- a) $5\sqrt{5} + \sqrt{3}$ b) $5\sqrt{5} + \sqrt{15}$ c) $5\sqrt{5} - \sqrt{3}$
d) $8\sqrt{8} - 2\sqrt{3}$ e) $6\sqrt{5}$
-

46. If the point $\left(-3, \frac{1}{2}\right)$ lies on the graph of the equation $2x + ky = -11$, find the value of k .

- a) $-\frac{5}{2}$ b) -34 c) $-\frac{17}{2}$ d) -10 e) -5
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47. Arrange the lines l , m , p , and q in order of increasing slope.

- a) $qlpm$ b) $lqpm$ c) $qlmp$
d) $plmq$ e) $pmlq$



48. Find 3 consecutive integers whose sum is 480. (enter the numbers separated by commas)

49. Solve for x : $y = mx + b$

a) $x = \frac{y-b}{m}$

b) $x = \frac{b+y}{m}$

c) $x = \frac{y}{m} + b$

d) $x = \frac{y}{m} - b$

50. Write an equation that describes the pattern shown below

x	2	3	4	5	6
y	1	-1	-3	-5	-7

a) $y = 2x$

b) $y = 0.5x$

c) $y = -0.5x + 2$

d) $y = -2x + 5$

3) $y = -2x + 1$

END OF ASSESSMENT