

**Algebra Skills Assessment for incoming MLWGS students**

**No calculator permitted**

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

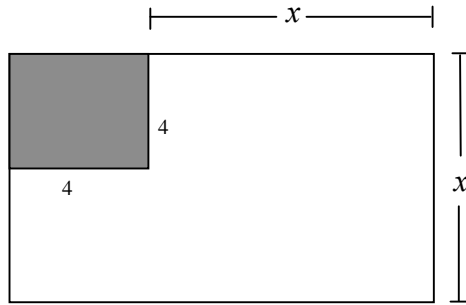
**Submit answers to <http://www.quia.com/quiz/4179124.html>**

**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.
- 
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.
- 
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.
- 
4.  $\sqrt{5^2 + 4^2} =$
- a) 20
  - b) 9
  - c) 81
  - d)  $\sqrt{41}$
  - e) undefined
- 
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)  $9x^4 + 25x^2 + 4$
- 
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) $(2x - 3)(3x - 2)$ |

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)  $y = \frac{5}{4}x - \frac{15}{4}$
- 

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
- 

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
- 

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

$x =$  \_\_\_\_\_

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

$x =$  \_\_\_\_\_

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

$x =$  \_\_\_\_\_

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

$x =$  \_\_\_\_\_

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

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

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

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

---

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

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

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

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

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**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.  $y =$  \_\_\_\_\_

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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)  $\frac{9}{5}$
- 

45.  $\sqrt{125} + \sqrt{27} - \sqrt{12}$  is equal to

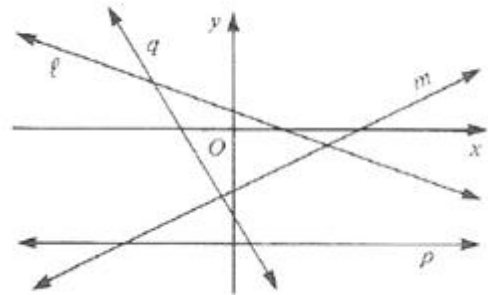
- a)  $5\sqrt{5} + \sqrt{3}$       b)  $5\sqrt{5} + \sqrt{15}$       c)  $5\sqrt{5} - \sqrt{3}$   
d)  $8\sqrt{8} - 2\sqrt{3}$       e)  $6\sqrt{5}$
- 

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)  $-5$
- 

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)

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

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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)  $y = -2x + 1$

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END OF ASSESSMENT