

**Algebra Skills Assessment for incoming MLWGS students interested in  
Algebra II Plus**

**Complete by April 17th**

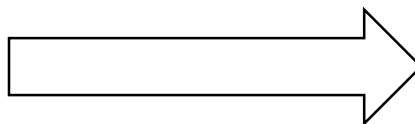
**NO CALCULATOR PERMITTED**

**Take no more than 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 or any other resources**. You should not look over this assessment in order to review prior to taking it. You should complete this test in a single session of no more than 75 minutes. The score on this test will help you to schedule for the most appropriate Algebra II course.

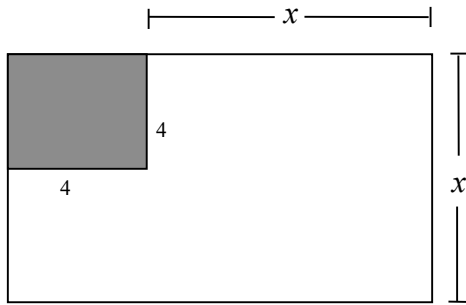
**Start your timer and begin**



## 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)  $(y^3)^{100} = y^3 y^{100}$
  - b)  $(y^3)^{100} > y^3 y^{100}$
  - c)  $(y^3)^{100} < y^3 y^{100}$
  - 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?



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Factor Completely. If not factorable, write prime.

8.  $2a^2b^2 + 8a^3b^3$

9.  $p^2 - 14p + 49$

10.  $25x^2 + 16$

11.  $6x^2 - 35x - 6$

12.  $7x^2 - 10x + 3$

13.  $a^2 - 49b^2$

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14. Which of the following is equivalent to  $\left(a + \frac{b}{2}\right)^2$ ?

a.  $a^2 + \frac{b^2}{2}$       b.  $a^2 + \frac{b^2}{4}$       c.  $a^2 + \frac{ab}{2} + \frac{b^2}{2}$       d.  $a^2 + ab + \frac{b^2}{4}$

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15. In the year 2000, Ellie's Bakery sold 65,500 donuts and in the year 2010 they sold 66,000 donuts. Assuming the amount of donuts sold each year increases at a constant rate, how many more donuts did they sell each year?

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16. If  $\frac{2a}{b} = 4$ , then  $\frac{b}{a} = ?$

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  $y=1$
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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)  $\frac{R-T}{RT}$
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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) -5      d)  $\frac{5}{3}$       e) 5
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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)  $y = \frac{3}{2}x$

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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

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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.  $x^2 + 2x = 15$

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

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

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

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

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

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

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

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

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

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$$32. (x - 3)(2x) = 0$$

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

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

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

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

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

**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.  $(x)\left(\frac{1}{x}\right) = 1$ , 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.  $-x < 0$

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

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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)  $8\sqrt{8} - 2\sqrt{3}$

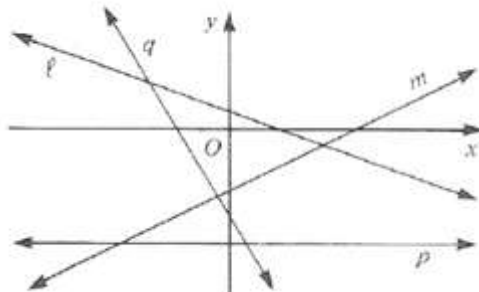
e)  $6\sqrt{5}$

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)

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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**