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/6298018.html

Feel free to print this test and use scratch paper, but do not use a calculator. You should not look over this assessment in order to review prior to taking it. The score on this test will allow us to schedule you for the most appropriate course.

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) $(y^3)^{100} = y^3 y^{100}$

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.

---

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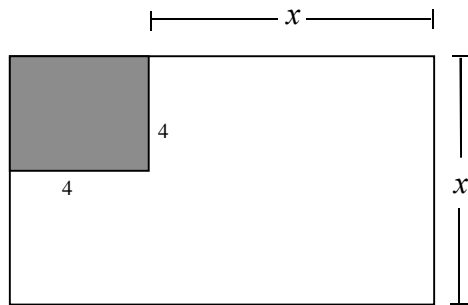
Match the polynomial with its factored form. Write the letter of the factored form in the
blank.

_____ 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 $x = \dfrac{2}{3}$

    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 $3x$ ó $5y + 8 = 0$?

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

---

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

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

---

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

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

---

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

a) $-\dfrac{5}{3}$ b) $-\dfrac{3}{5}$ c) ó5   d) $\dfrac{5}{3}$ e) 5

---

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

a) $y = \dfrac{4}{5}x + 3$ b) $y = \dfrac{4}{5}x + \dfrac{12}{5}$ c) $y = \dfrac{2}{3}x$

d) $y = \dfrac{5}{4}x - 3$ e) $y = \dfrac{5}{4}x - \dfrac{15}{4}$

---

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) $y = \dfrac{3}{2}x$

24. Given $f(x) = \sqrt{x-2} + \dfrac{3}{x}$, 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 though (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 = $ _____

---

28. $3(x ó 2)^2 = 12$

     $x = $ _____

---

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

     $x = $ _____

---

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

     $x = $ _____

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

$x = $ _____

---

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

$x = $ _____

---

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

$x = $ _____

---

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

$x = $ _____

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. $(x)\left(\dfrac{1}{x}\right) = 1$, *where* $x \neq 0$.

36. $x + -x = 1$

37. $x > |x|$

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

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

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 $\left(\sqrt{\dfrac{x^2}{16}} \right)\left(\sqrt{\dfrac{4x^2}{25}} \right)$

   a) $\dfrac{3}{10}$
   b) $\dfrac{9}{10}$
   c) $\dfrac{27}{100}$
   d) $\dfrac{39}{20}$
   e) $\dfrac{9}{5}$

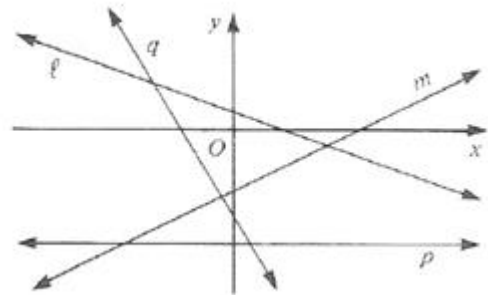45. $\sqrt{125} + \sqrt{27} - \sqrt{12}$ is equal to

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

   a) $-\dfrac{5}{2}$
   b) -34
   c) $-\dfrac{17}{2}$
   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)

---

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

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

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

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

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

---

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