



## *Placement Test – Level II*

**Directions:** Complete all problems to the best of your ability. Show all of your work. You may use a non-graphing calculator to do basic calculations, but not to factor or graph. There is no time limit. Each problem is worth 1 point. When you are done, please grade your test using the “Placement Test – Level II – Answer Key”.

1. Translate the phrase into an algebraic expression and simplify.

the quotient of  $8x$  and  $4x$

2. Solve.  $12 + 2(4 - 3y) = -5(y - 2) + 1$





3. Solve and classify the equation as a conditional equation, an identity, or a contradiction.

$$12(5 - 2x) = -12(x - 4) - 12x$$

4. Solve.

$$\frac{1}{3}x + \frac{2}{5}x = 7 - \frac{3}{4}x$$

5. Solve the formula for y.  $5x + 9y = -2$





6. Solve the inequality, graph the solution on a number line, and write the solution in interval notation.

$$3m + 4(2m - 5) \leq 6m - 9$$

7. One number is four more than seven times another. Their sum is 20. Find the numbers.

8. 70 is what percent of 130?





9. Joseph has \$4.20 in quarters and nickels in his coin jar. He has twice as many nickels as quarters. Find the number of each type of coin.

10. The perimeter of a triangle is 39 feet. One side of the triangles is five feet longer than the second side. The third side is four feet longer than the second side. Find the length of each side.





11. Two cars leave a rest area on the interstate at the same time. One car travels east and the other travels west. The car traveling east travels at 50 mph and the car traveling west travels at 60 mph. How long will they travel before they are 240 miles apart?

12. Piper's phone plan costs \$18.50 per months plus \$0.05 per text message. What is the maximum number of text messages Pipers can use so the phone bill is no more than \$26?

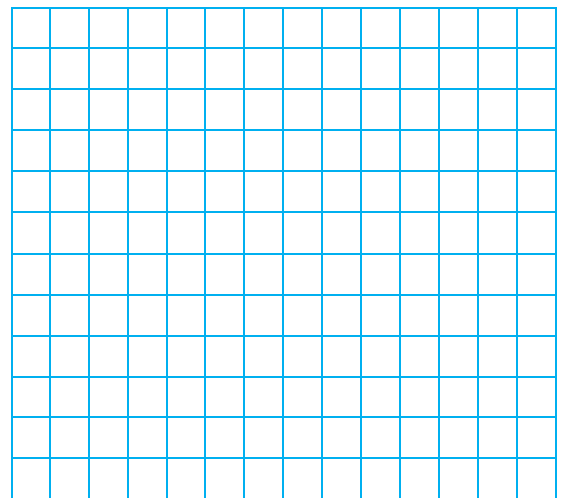




13. Determine if the given ordered pair is a solution to the equation.

$$4x - 3y = 8 ; (-2, 1)$$

14. Graph the equation.  $3x - 4y = 12$



15. Find the x- and y-intercepts of the line.

$$-x + 3y = 6$$





16. Find the slope of the line containing the following points. The slope formula is

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad (-3, 5) \text{ and } (-4, -2)$$

17. Determine if the lines are parallel, perpendicular, or neither.

$$4x - 2y = 5 \quad ; \quad 3x + 6y = 11$$

18. Find the equation of the line with the given slope and passing through the given point. The point-slope equation is  $y - y_1 = m(x - x_1)$ .

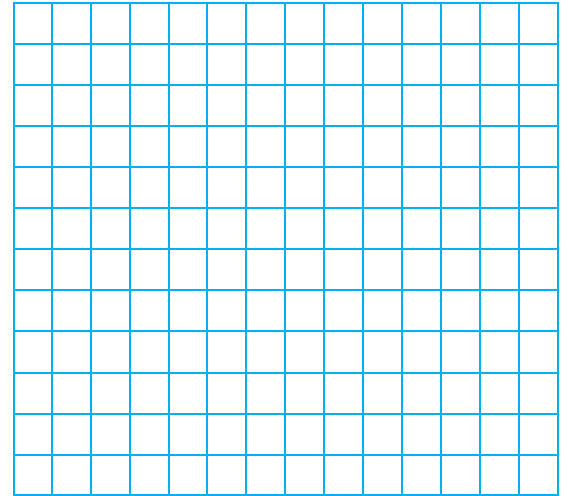
$$m = -\frac{1}{3} \quad ; \quad (-1, 4)$$





19. Graph the linear inequality.

$$x + 2y > 8$$



20. Determine the number of solutions to the system of equations.

$$3x - 5y = 20$$

$$y = \frac{3}{5}x + 10$$

21. Solve the system of equations using the substitution method.

$$x + y = 4$$

$$2x + 3y = 7$$







22. Solve the system of equations using the elimination method.

$$3x + y = 9$$

$$4x - 2y = 12$$

23. Tickets to the county fair cost \$25 for adults and \$10 for children. The total receipts for 358 tickets was \$5,485. How many adult and how many child tickets were sold?

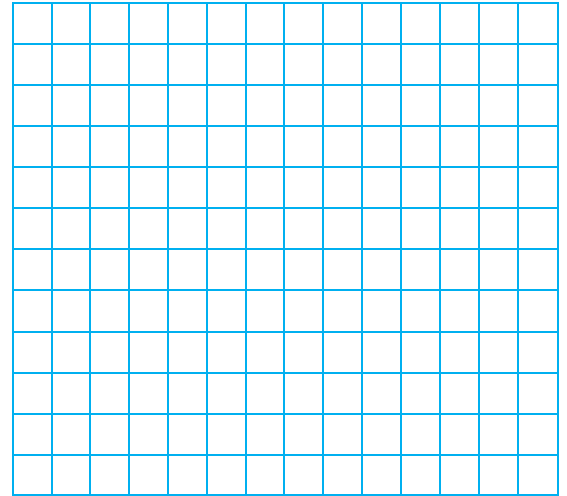




24. Solve the system of inequalities by graphing.

$$y < x + 3$$

$$y \geq x - 1$$



25. Find the difference.  $(9x^2 + 7x - 3) - (4x^2 - 6x + 1)$

26. Evaluate the polynomial for the given values.

$$8x^2y + 5x - 4y ; x = -2, y = 3$$





27. Simplify.  $r^2 \cdot r^7 \cdot r^3$

28. Multiply.  $(x + 2)(2x^2 - 3x + 4)$

29. Multiply.  $(n + 11)^2$

30. Simplify.  $\left(\frac{z^3}{z^7}\right)^2$

31. Divide.  $(45w^4 - 20w^2 + 10w) \div (5w)$





32. Divide.  $(y^2 + 13y + 40) \div (y + 8)$

33. Simplify.  $(-4c^{-5}d^3)(9c^2d^7)$

34. Factor completely.  $x^3 + x^2 + 5x + 5$





35. Factor completely.  $x^2 + 11xy + 30y^2$

36. Factor completely.  $30x^2 - 5x - 10$

37. Factor completely. The difference of squares formula is:  $a^2 - b^2 = (a - b)(a + b)$ .  
 $144w^2 - 25z^2$

38. Factor completely. The sum of cubes formula is:  $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$ .  
 $8c^3 + 125d^3$





39. Solve.  $27x^2 - 3x - 4 = 0$

40. Simplify.  $\frac{x^2+x-20}{x^2-16}$

41. Divide.  $\frac{x^2-3x}{x^2+x-12} \div \frac{x}{x+4}$





42. Subtract.  $\frac{x^2}{5x-30} - \frac{5x+6}{5x-30}$

43. Add.  $\frac{8}{m+9} + \frac{12m}{m^2+4m-45}$

44. Simplify.  $\frac{\frac{1}{x} + \frac{1}{y}}{\frac{1}{x^2} - \frac{1}{y^2}}$





45. Solve. 
$$\frac{x^2}{x^2-4} = \frac{x}{x+2} - \frac{2x}{2-x}$$

46. Charlotte loves to drink fruit smoothies. A 16 ounce serving of smoothie has 185 calories. If she drinks 22 ounces of smoothies, how many calories of smoothie is she consuming?

47. Find an equation of variation in which  $y$  varies directly as the square of  $x$  and  $y = 10$  when  $x = 2$ .







48. Simplify.  $\sqrt{300x^7y^{12}}$

49. Simplify.  $\sqrt{\frac{108z^6}{49}}$

50. Subtract.  $\sqrt{45} - \sqrt{20}$

51. Multiply.  $(8 + 2\sqrt{3})(1 - 4\sqrt{3})$





52. Simplify and rationalize the denominator.  $\sqrt{\frac{8}{45}}$

53. Solve.  $x = \sqrt{2x + 7} - 2$





54. Add.  $\sqrt[4]{80} + \sqrt[4]{405}$

55. Simplify.  $9^{-\frac{3}{2}}$

56. Solve.  $x^2 = 75$

57. What number would need to be added to this expression to complete the square to make a perfect square trinomial?

$$z^2 + 3z$$





58. Solve. The quadratic formula is  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ .

$$x^2 - 6x - 4 = 0$$

59. The width of a rectangular flower bed is 7 feet less than the length. The area is 18 feet squared. Find the length and the width. The area formula for a rectangle is:  
 $A = L \cdot W$ .





60. Graph the parabola.

$$y = x^2 - 2x - 3$$

