

Algebra Review Packet

Directions:

This packet is created to help prepare you for your upcoming ISTEP test. You are only required to do the even numbers only, but in order to be fully prepared, it is recommended that you do all problems in this packet.

You will receive 10 points a day on how hard you work and you will receive 20 points for completing the 33 problems required. This is a total of 40 points. This packet is due on Tuesday, April 18th.

Name:

Directions: For questions 1 - 41, DO NOT USE A CALCULATOR. Please show all work.

Simplify.

1. $(-16) + (-42) + (-25) + (-19)$ 1. _____

2. $-15 - (-4)(6) + (-44) \div (-11)$ 2. _____

Evaluate if $a = 18$, $b = 3$, $c = 4$, and $d = 5$.

3. $a - b \cdot c + d$ 3. _____

4. $a - (b \cdot c + d)$ 4. _____

5. $a - b \cdot (c + d)$ 5. _____

6. $(a - b) \cdot c + d$ 6. _____

Simplify.

7. $6x + 7y + 8x - 2y$ 7. _____

8. $3m(n - 2m) - 2n(2m - 3n)$ 8. _____

9. $(2a - 5) - (4a + 6) + (7 - 2a)$ 9. _____

10. $\frac{3a^2}{4} + \frac{2ab}{3} + ab - a^2$ 10. _____

11. $-\frac{10}{7} \div \left(-\frac{5}{9}\right)$ 11. _____

12. $-3\left(-\frac{7}{4}a + \frac{1}{6}\right) + \frac{5}{2}\left(3 - \frac{a}{2}\right)$ 12. _____

Solve.

13. $5a + 2a - 6 = 4a - 5$ 13. _____

14. $x + 5 = \frac{1}{3}(6x - 5)$ 14. _____

15. $\frac{8 - 5r}{6} = 3$ 15. _____

16. A year-end clearance sale is advertised as 30% off all prices as marked.
What is the sale price of a sofa that is marked as \$925?

16. _____

17. If a calculator costs \$12.90 after a 25% discount, what is the original price of the calculator?

17. _____

18. Evaluate $|4 - x|$, if $x = -2$.

18. _____

19. Evaluate $|a| - |2b|$, if $a = -5$ and $b = 1$

19. _____

20. Evaluate $-|m + n|$, if $m = 3$ and $n = -12$

20. _____

Write an expression or equation for each of the following.

21. The product of six less than a number and five more than the same number.

21. _____

22. The number c equals the cube of the sum of 2 and three times m .

22. _____

23. Twelve decreased by the square of a is equal to b .

23. _____

Simplify.

24. $(2x^2 - 5x + 7) - (3x^3 + x^2 + 2)$

24. _____

25. $(4x^2 - 3x + 7) + (2x^2 + 4x)$

25. _____

26. $y^3 \cdot y^4 \cdot y$

26. _____

27. $(-4a^2x)(-5a^3x^4)$

27. _____

28. $\frac{-16a^3b^2x^4y}{-48a^4bxy^3}$

28. _____

29. $(-3x^3y)^2(4x)^3$

29. _____

30. Find p if $p = m^3 - 3mn - n^2$ and $m = -1, n = 2$

30. _____

Find each product.

31. $(x-5)(x-4)$ 31. _____

32. $(4n+3)(3n-4)$ 32. _____

33. $(a-4)(a^2+5a-7)$ 33. _____

34. $(2x+9y)(3x-y)$ 34. _____

Factor.

35. $5a^2b^2c-15abc^2$ 35. _____

36. x^2-7x+6 36. _____

37. b^2+5b-6 37. _____

38. $2r^2-3r-20$ 38. _____

39. $6x^2-5x-6$ 39. _____

40. y^2-25 40. _____

41. The length of a rectangle is 3 feet less than twice the width. If the area of the rectangle is 54 ft^2 , find the dimensions of the rectangle.

41. _____

Solve these quadratics.

42. $(x-8)(x-4)=0$ 42. _____

43. $x^2-8x-20=0$ 43. _____

44. $9k^2-12k-1=0$ 44. _____

45. Find the slope of a line that passes through the points $(-6, 4)$ and $(3, 5)$.

45. _____

46. X and Y are points on a number line with coordinates -12 and 14 , respectively. Find the coordinates of the midpoint of segment \overline{XY} .

46. _____

47. Point M(5, 2) is the midpoint of segment \overline{XY} . Point X has coordinates (-4, 6). Find the coordinates of point Y.

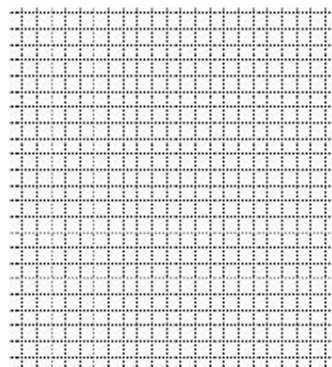
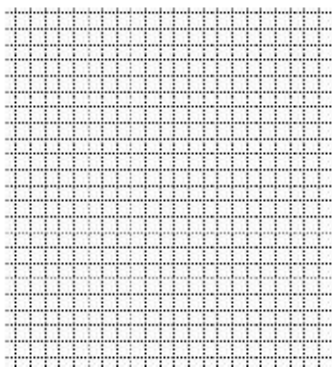
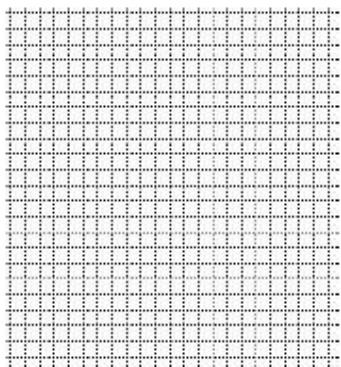
47. _____

Graph the linear equations.

48. $y = -3x + 2$

49. $3x - 2y = 10$

50. $y = 2$



Simplify. Rationalize the denominator when necessary.

51. $\sqrt{144}$

51. _____

52. $\sqrt{24}$

52. _____

53. $\sqrt{108}$

53. _____

54. $\frac{2}{\sqrt{6}}$

54. _____

55. $\frac{3\sqrt{3}}{\sqrt{2}}$

55. _____

56. $4\sqrt{27} + 8\sqrt{48}$

56. _____

57. The points (4, 2) and (-1, y) are $\sqrt{74}$ units apart. What is the value of y?

57. _____

Solve these systems of equations.

58.
$$\begin{cases} 2m + n = 1 \\ m - n = 8 \end{cases}$$

58. _____

59.
$$\begin{cases} 3x - 2y = -4 \\ 3x + y = 2 \end{cases}$$
 59. _____

60. $3x - 1 = y$ and $4y = 3 - 2x$ 60. _____

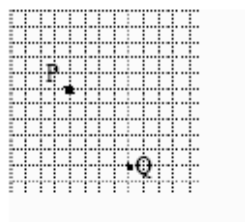
61. Westville has a population of 7200, which is decreasing at a rate of 80 people per year. Troy has a population of 5000 and is gaining 120 people per year. In how many years will the populations of Westville and Troy be the same?

61. _____

62. One evening, the candy counter at the Cineplex sold 532 buckets of popcorn for \$1489.50. A large bucket sells for \$2.25 and a jumbo buckets sells for \$3.75. How many jumbo buckets of popcorn were sold?

62. _____

63. In the graph below, the axes and the origin are not shown. If point P has coordinates $(4, 2)$, what are the coordinates of point Q ?



63. _____

Solve.

64. $\frac{5}{6} = \frac{a-2}{4}$ 64. _____

65. $\frac{y+4}{y-1} = \frac{4}{3}$ 65. _____

66. $\frac{6-z}{z} = \frac{z-6}{2}$ 66. _____

67. On the blue prints for a house, 2 inches represents 3 feet. If the width of a room on the plan is $6\frac{1}{2}$ inches, what is the actual width of the room? 67. _____

Formulas

Use the following formulas in the coordinate plane when given two points (x_1, y_1) and (x_2, y_2) .

Distance Formula: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Midpoint Formula: $(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$

Slope Formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Use the following formula when solving an equation in the form $ax^2 + bx + c = 0$.

Quadratic Formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$