

# Algebra 2

## Summer Review Packet

These problems represent a review of Algebra I material. You are expected to have a full understanding of this material **prior** to the start of this course. If you wait until the week before school starts to complete this packet, you may not have enough time to access additional resources if you need them.

### DIRECTIONS:

- Complete the packet on separate paper.
- Show all work.
- All graphs must be done on graph paper.
- Do all problems **WITHOUT** the use of a calculator.
- Bring your work with you on the first day of class.

If you are having difficulty on a section of these problems, refer to the following resources:

- Your Algebra 1 notebook
- Khanacademy.com

Answers are included at the end of the packet for you to use to check your work.

**Order of Operations:** Simplify each expression. DO NOT USE A CALCULATOR!

1.  $(6-5)^3 + 14 \div (2+5)$

2.  $7+5-(8+2)-(-6)$

3.  $[2-5(4+6)] \div (-6)$

4.  $-(4)\left(\frac{1}{6}\right)(-3)$

5.  $(-3)^2 - (4)(-1)$

6.  $\frac{-4-5}{7+(-2)^2}$

7.  $\frac{-12+2(6)}{4-(-3)}$

8.  $\frac{-9(9-3)}{2^4-7}$

**Simplifying Expressions:** Simplify each expression completely.

9.  $7(q-2)+5q+14$

10.  $3t+5t^2-2t+6t^2$

11.  $8d+2d^2-3(d+d^2)$

12.  $-(y-2)+2-y$

13.  $2n(n-8)-5n^2+21n-7$

14.  $\frac{1}{28}(7w-21)$

15.  $\frac{1}{2}(6x+4)-\frac{1}{4}(8x-8)$

16.  $3(a-6)-\frac{2}{3}(9+12a)$

**Evaluate Expressions:** Evaluate each expression for the given values.

17.  $x^2 + 2y^2$  for  $x = 3, y = 2$

18.  $-3x^2 + (3y)^4$  for  $x = -5, y = -1$

19.  $\frac{3x+y-1}{2x-y}$  for  $x = 3, y = 4$

20.  $\frac{(2x-2)^3}{-y^3-3}$  for  $x = 2, y = -2$

21.  $(c-b)(c+b)$  for  $c = -1, b = 3$

22.  $a^2 + 2ab + b^2$  for  $a = -2, b = 3$

23.  $\frac{b+c}{a+b}$  for  $a = -2, b = 3, c = -1$

24.  $ac + bc$  for  $a = -2, b = 3, c = -1$

**Solving Equations:** Solve each equation.

25.  $6x-5=2x-21$

26.  $7b+5b+20=2b-20$

27.  $4x-12=-12+4x$

28.  $16h-4(5h-7)=4$

29.  $6(2a+10)=5(a+5)$

30.  $\frac{2}{3}x-7=5$

31.  $\frac{1}{5}(10x-15)=3-2x$

32.  $-2.5x+2=0.5(8-6x)$

**Rewriting Equations:** Solve for the indicated variable.

33.  $A = \frac{1}{2}bh$ ; solve for  $b$

35.  $5y + 2x = 15$ ; solve for  $y$

34.  $V = lwh$ ; solve for  $w$

36.  $4x - 3y = 21$ ; solve for  $y$

**Slope:**

Sketch a line with...

37. Positive slope

38. Negative slope

39. Zero slope

40. Undefined slope

Find the slope of the line given two points.

41.  $(4,1)$   $(2,7)$

43.  $(0,4)$   $(-2,8)$

42.  $(2,3)$   $(4,3)$

44.  $(6,-8)$   $(6,4)$

45. Perpendicular lines have \_\_\_\_\_ slopes.

46. Parallel lines have \_\_\_\_\_ slopes.

**Graphing Linear Functions:** (All graphs for #47-51 are to be done on graph paper.)

*On graph paper*, draw the line given using slope and  $y$ -intercept.

47.  $y = \frac{3}{2}x - 4$

49.  $y = -2$

48.  $x = 5$

50.  $y = -2x + 3$

*On graph paper*, draw the line by finding and graphing  $x$  and  $y$  intercepts.

51.  $5x - 3y = 15$

**Writing Equations of Lines:** (Write all final answers in slope-intercept form)

Write the equation of the line that has the given slope and given  $y$ -intercept.

52. slope = 2,  $y$ -intercept =  $-3$

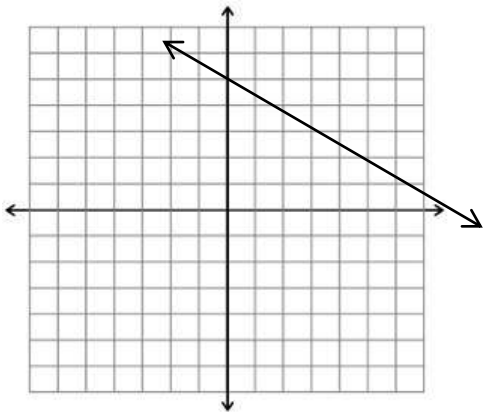
53. slope =  $-5$ ,  $y$ -intercept = 12

54. slope =  $\frac{1}{2}$ ,  $y$ -intercept = 9

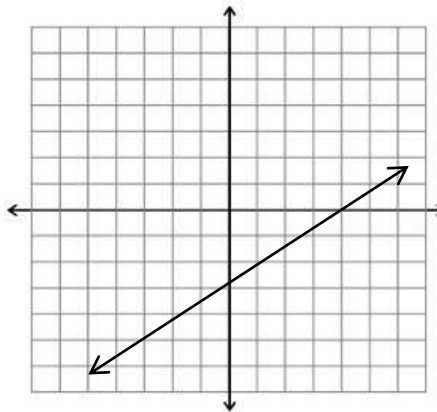
55. slope =  $-4$ ,  $y$ -intercept =  $-6$

Write the equation of the line that corresponds to the line graphed.

56.



57.



**Remember:** If the *y*-intercept is not given, you **MUST** use point-slope form.  $y - y_1 = m(x - x_1)$

Write the equation of the line with the given slope through the given point.

58. slope = 2, point (5, 2)

59. slope =  $\frac{1}{2}$ , point (2, -4)

Write the equation of each line.

60. Line through (5, -2) and parallel to  $y = -\frac{1}{2}x + 5$

61. Line through (-3, -8) and perpendicular to  $y = -4x + 2$

Write the equation of the line that passes through the given pair of points.

62. (0, -3) and (6, -2)

63. (-3, -1) and (5, -8)

**Systems of Equations:** Solve the system of linear equations by the given method. Identify your answer as an ordered pair.

64. Use ELIMINATION to solve: 
$$\begin{cases} 3x + 2y = -5 \\ 4x - 3y = 16 \end{cases}$$

65. Use SUBSTITUTION to solve: 
$$\begin{cases} 5x - y = 13 \\ x - 4y = -5 \end{cases}$$

66. Use GRAPHING to solve: 
$$\begin{cases} x + y = 1 \\ 3x - y = -5 \end{cases}$$
 **(Graph must be done on graph paper.)**

**Multiplying Polynomials:** Find the product and simplify completely.

67.  $(5x+1)(3x-2)$

68.  $(c-7)^2$

69.  $(-4x)(2x^2+5x-3)$

70.  $(3x-2)(3x+2)$

71.  $(4y-1)(6y+5)$

72.  $(k+8)^2$

73.  $(-6)(2d^2-d+5)$

74.  $(9a-4)(9a+4)$

**Factoring:** Factor the following expressions completely.

75.  $n^2+7n+6$

76.  $b^2-14b+45$

77.  $x^2+6x-27$

78.  $a^2+9a-36$

79.  $4x^2+12x+9$

80.  $x^2-49$

81.  $5x^2+3x-8$

82.  $2x^2+10x+8$

83.  $3n^2-16n+5$

84.  $3x^3-4x^2-4x$

85.  $5d^3+10d^2-35d$

86.  $4x^2-28x+48$

87.  $2a^2-24a$

88.  $5p^2-80$

89.  $3w^3+15w^2-27w$

90.  $xy-y$

**Properties of Exponents:** Simplify each expression completely. Express all answers with positive exponents.

91.  $(2x)^{-3}$

92.  $(-5)^0$

93.  $(2x^2y^3)(3xy^2)$

94.  $\frac{(6m^2n)^2}{(3mn^2)^3}$

95.  $(-4x^{-3}y^5)^3$

96.  $\left(\frac{2x}{3y^2}\right)^{-2}$

**Simplifying Radicals:** Simplify each expression completely.

97.  $3\sqrt{48}$

98.  $\sqrt{98x^2y^5}$

99.  $\sqrt{8x} \cdot \sqrt{10x}$

100.  $\sqrt{\frac{100}{3}}$

**Solving Quadratic Equations:** Solve using any method.

101.  $x^2 - 3x - 28 = 0$

102.  $5x^2 - 35x = 0$

103.  $x^2 + 12x + 40 = 4$

104.  $x^2 - 121 = 0$

105.  $x^2 + 14x + 10 = 2$

106.  $3x^2 + 7x - 20 = 0$

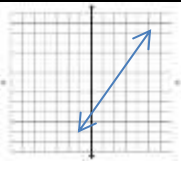
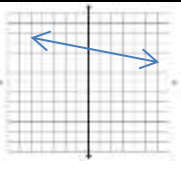
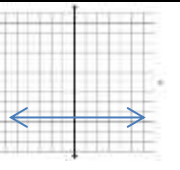
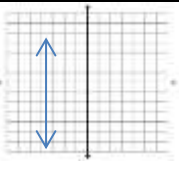
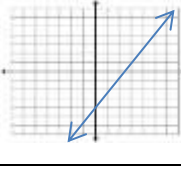
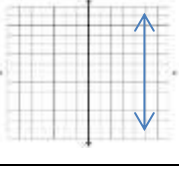
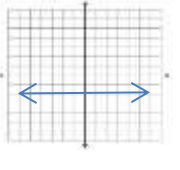

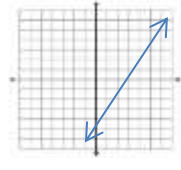
107.  $x^2 + 64 = 0$

108.  $x^2 - 9x - 12 = 3$

109.  $2x^2 + x - 13 = 0$

110.  $x^2 + 6x + 9 = 8$

### Algebra 2 Summer Review Packet - Answers

1. 3	2. 8	3. 8	4. 2
5. 13	6. $-\frac{9}{11}$	7. 0	8. -6
9. $12q$	10. $11t^2 + t$	11. $-d^2 + 5d$	12. $-2y + 4$
13. $-3n^2 + 5n - 7$	14. $\frac{1}{4}w - \frac{3}{4}$	15. $x + 4$	16. $-5a - 24$
17. 17	18. 6	19. 6	20. $\frac{8}{5}$
21. -8	22. 1	23. 2	24. -1
25. $x = -4$	26. $b = -4$	27. all $\mathbb{R}$	28. $h = 6$
29. $a = -5$	30. $x = 18$	31. $x = \frac{3}{2}$	32. $x = 4$
33. $b = \frac{2A}{h}$	34. $w = \frac{V}{lh}$	35. $y = -\frac{2}{5}x + 3$	36. $y = \frac{4}{3}x - 7$
37. 	38. 	39. 	40. 
41. $m = -3$	42. $m = 0$	43. $m = -2$	44. undefined
45. opposite reciprocal	46. same	47. 	48. 
49. 	50. 	51. 	52. $y = 2x - 3$
53. $y = -5x + 12$	54. $y = \frac{1}{2}x + 9$	55. $y = -4x - 6$	56. $y = -\frac{2}{3}x + 5$
57. c	58. $y = 2x - 8$	59. $y = \frac{1}{2}x - 5$	60. $y = -\frac{1}{2}x + \frac{1}{2}$
61. $y = \frac{1}{4}x - \frac{29}{4}$	62. $y = \frac{1}{6}x - 3$	63. $y = -\frac{7}{8}x - \frac{29}{8}$	64. (1, -4)
65. (3, 2)	66. (-1, 2)	67. $15x^2 - 7x - 2$	68. $c^2 - 14c + 49$
69. $-8x^3 - 20x^2 + 12x$	70. $9x^2 - 4$	71. $24y^2 + 14y - 5$	72. $k^2 + 16k + 64$
73. $-12d^2 + 6d - 30$	74. $81a^2 - 16$	75. $(n+6)(n+1)$	76. $(b-9)(b-5)$
77. $(x+9)(x-3)$	78. $(a+12)(a-3)$	79. $(2x+3)^2$	80. $(x+7)(x-7)$

81. $(5x+8)(x-1)$	82. $2(x+1)(x+4)$	83. $(3n-1)(n-5)$	84. $x(3x+2)(x-2)$
85. $5d(d^2+2d-7)$	86. $4(x-4)(x-3)$	87. $2a(a-12)$	88. $5(p+4)(p-4)$
89. $3w(w^2+5w-9)$	90. $y(x-1)$	91. $\frac{1}{8x^3}$	92. 1
93. $6x^3y^5$	94. $\frac{4m}{3n^4}$	95. $-\frac{64y^{15}}{x^9}$	96. $\frac{9y^4}{4x^2}$
97. $12\sqrt{3}$	98. $7xy^2\sqrt{2y}$	99. $4x\sqrt{5}$	100. $\frac{10\sqrt{3}}{3}$
101. $x = \{-4, 7\}$	102. $x = \{0, 7\}$	103. $x = \{-6\}$	104. $x = \{\pm 11\}$
105. $x = \{-7 \pm \sqrt{41}\}$	106. $x = \left\{-4, \frac{5}{3}\right\}$	107. $x = \{\pm 8i\}$	108. $x = \left\{\frac{9 \pm \sqrt{141}}{2}\right\}$
109. $x = \left\{\frac{-1 \pm \sqrt{105}}{4}\right\}$	110. $x = \{-3 \pm 2\sqrt{2}\}$		



