

Name: _____

Skills Review for Students Entering Algebra II

The following is a review of math skills that you will be expected to apply in your Algebra II course next year. Complete this review over the summer. It is due on the first day of class and will be worth three homework credits.

The purpose of the packet is to provide an opportunity for you to refresh yourself on some math skills that you will be using throughout the Algebra II course. Solutions to the problems are attached and students are expected to check their answers. If you have difficulty with any topic, it is recommended that you invest some time over the summer reviewing those particular skills, so that you will come to Algebra II prepared for success. One way to review would be look on-line for tutorials and practice problems on that topic. Some suitable sites are listed below:

<http://www.khanacademy.org>

<http://www.coolmath.com/>

<http://www.purplemath.com/>

Calculators should NOT be used on this packet.

Show all work where calculations are necessary.

Operations with Integers

Evaluate the expression.

1. $-12+8$

2. $-5-18$

3. $56 \div (-7)$

4. $6(4-9)$

5. $\frac{30-6}{2 \cdot 4^2 - 20}$

Operations with Rational Numbers

Evaluate the expression. Write your answer in simplest form.

7. $\frac{3}{5} + \frac{4}{5}$

8. $\frac{2}{3} - \frac{7}{12}$

9. $12.65 - 9.599$

10. $\frac{4}{9} \times \frac{27}{16}$

11. $\frac{18}{7} \div \frac{6}{14}$

12. $\left(\frac{2}{9} + \frac{5}{6}\right) - \frac{1}{3}$

Square Root Concepts

Evaluate the expression.

13. $\sqrt{49}$

14. $\pm\sqrt{36}$

15. $-2\sqrt{81}$

Simplifying Square Roots

Simplify the expression. Rationalize the denominator when necessary.

16. $\sqrt{28}$

17. $\sqrt{8} \cdot \sqrt{12}$

18. $\sqrt{\frac{9}{5}}$

19. $3\sqrt{11} + 5\sqrt{11}$

20. $\sqrt{128} + \sqrt{50}$

Evaluating Expressions

Write a variable expression for the verbal phrase.

21. 76 divided by x

22. -8 minus x , times 5

Evaluate the expression for the given value of the variable.

23. $-6x$ when $x = -7$

24. $\frac{y}{11}$ when $y = -121$

Simplifying Expressions

Simplify the expression.

25. $-28 + 13x + 16$

26. $10x - (5 - 3x)$

27. $(6x^2 + 5x - 12) + (3x^2 - 8x - 10)$

28. $4y(2 - y) + 3y^2$

Properties of Powers

Evaluate the expression.

29. $3^2 \cdot 3^3$

30. $\left(\frac{2}{3}\right)^{-1}$

31. $\frac{5^6}{5^4}$

Simplify the expression. The simplified expression should have no negative exponents.

32. $\frac{4x^{13}}{6x^{-2}}$

33. $(3x \cdot x^4)^{-2}$

34. $(4xy)^0(x^2y^5)^3$

Simplifying Expressions with Powers

Simplify the product.

35. $\frac{x^2y}{3y^3x^3} \cdot \frac{18x^4y^2}{xy^6}$

36. $\frac{2x^{-2}y}{3y^{-3}x^2} \cdot \frac{3x^4}{8y^{-2}}$

Evaluate the expression. Write the result in scientific notation.

37. $(3 \times 10^5) \cdot (2 \times 10^8)$

38. $\frac{3.6 \times 10^{-5}}{1.2 \times 10^{-11}}$

Solving Equations

State the inverse.

39. Subtract 17

40. Divide by -7

41. Multiply by 0.5

Solve the equation.

42. $x - 15 = -8$

43. $\frac{3}{4}x = 18$

44. $5x - 3 = 17$

Solving Inequalities

Solve the inequality.

45. $x + 7 > 12$

46. $-9 \geq 5 + x$

47. $-8x \leq 48$

48. $\frac{x}{12} < -\frac{1}{3}$

49. $6 < -5x + 11$

50. $9 \leq \frac{2}{3}x - 3$

Solving Multi-Step Equations and Inequalities

Solve the equation, if possible.

51. $16x + 24 = 7(x + 6)$

52. $-4(2x - 1) = 3 - 8x$

53. $5(2x - 3) = -15 + 10x$

54. $-5x^2 = -125$

Solve the inequality.

55. $3(4 - 5x) < -3x$

56. $8(2 - x) \leq -4(x - 5)$

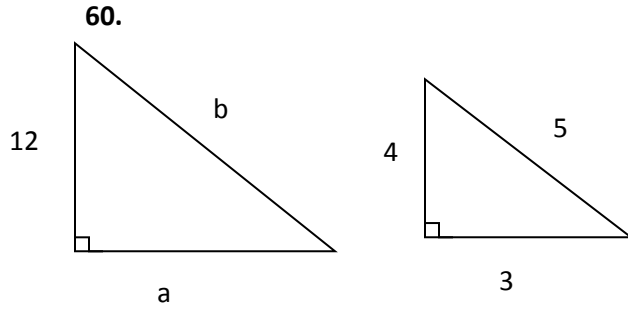
Writing and Solving Proportions

57. $\frac{x}{4} = \frac{3}{6}$

58. $\frac{x + 6}{4} = \frac{-4x}{16}$

59. $\frac{2}{3} = \frac{x + 7}{3x}$

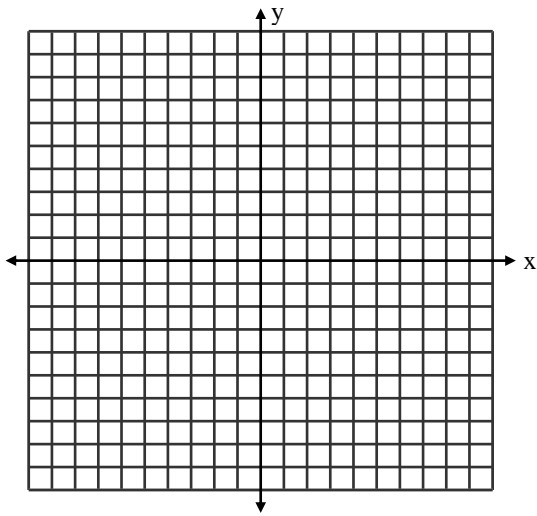
Pairs of similar triangles are shown. Find the missing lengths of sides.



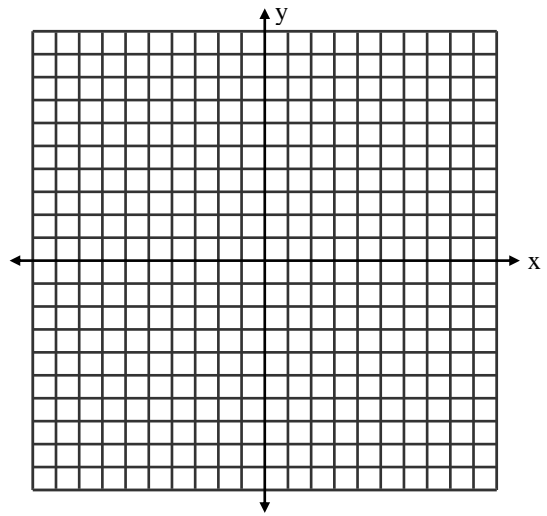
Plotting Points

Plot the ordered pair in a coordinate plane and tell whether it is in Quadrant I, 2, 3, or 4.

61. $(-3, 5)$



62. $(1, -6)$



Slope-Intercept Form of a Linear Equation

Find the slope and y-intercept of the graph of the equation.

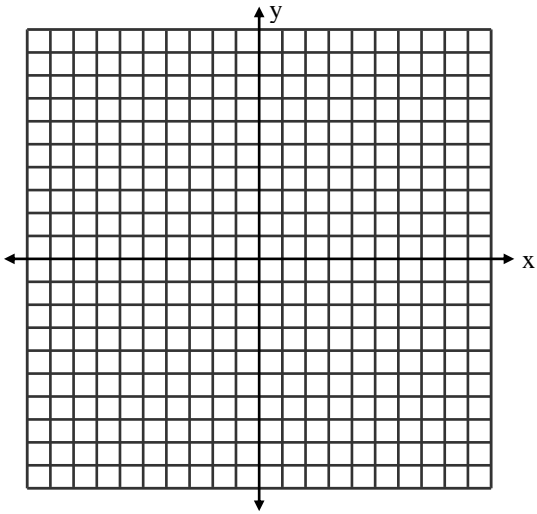
63. $y = -2x + 9$

64. $3x + 4y = 24$

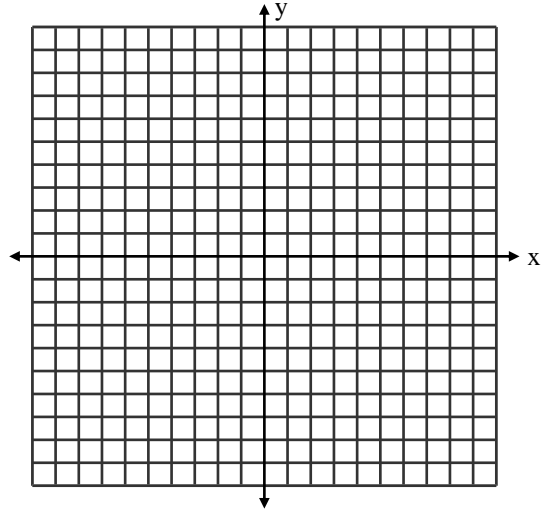
65. $y = \frac{2x + 7}{14}$

Graph the equation.

66. $y = 2x + 3$



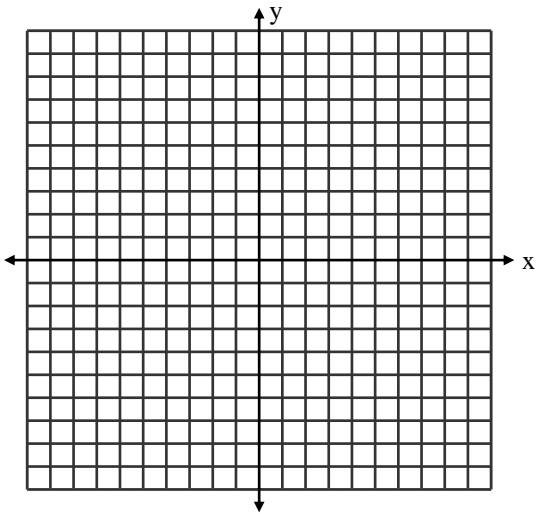
67. $y = -3x + 4$



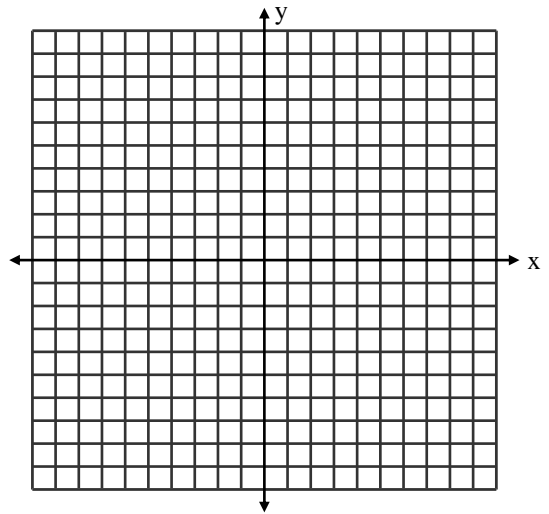
Quick Graphs Using Intercepts

Find the x-intercept and the y-intercept of the line. Graph the equation. Label the points where the line crosses the axes.

68. $y = x - 5$



69. $6x + 2y = -12$



Common Monomial Factors

Find the greatest common factor and factor it out of the expression.

70. $-2x^3 - 20x^2 + 14x$

71. $3x^5y^2 - 21x^2y^7$

72. $15x^5 - 10x^4 + 5x^2$

73. $-2x^2y^3 + 7xy^7$

Factoring $x^2 + bx + c$

Factor the trinomial.

74. $x^2 + 3x + 2$

75. $x^2 - 12x + 36$

76. $x^2 - 2x - 48$

77. $x^2 + 3x - 40$

Factoring $ax^2 + bx + c$

Factor the trinomial.

78. $2x^2 + x - 6$

79. $9x^2 + 24x + 16$

80. $3x^2 - 17x - 56$

81. $12x^2 + 46x - 36$

Factoring Special Cases

Factor the expression.

82. $16x^2 - 81$

83. $x^2 + 20x + 100$

84. $144 - x^2$

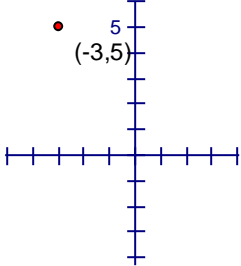
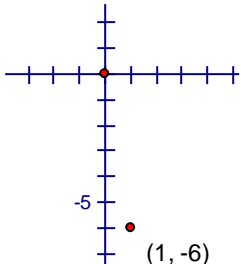
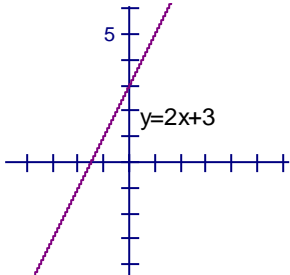
Factor the expression completely.

85. $x^5 - 9x^3$

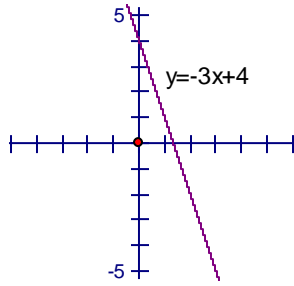
86. $x^3 + 11x^2 + 28x$

87. $-3x^3 - 15x^2 - 12x$

Skills Review for Students Entering Algebra II—Answer Key

<p>1. -4 2. -23 3. -8 4. -30 5. 2 6. ----- 7. $\frac{7}{5}$ 8. $\frac{1}{12}$ 9. 3.059 10. $\frac{3}{4}$ 11. 6 12. $\frac{13}{18}$ 13. 7 14. ± 6 15. -18 16. $2\sqrt{7}$ 17. $4\sqrt{6}$ 18. $\frac{3\sqrt{5}}{5}$ 19. $8\sqrt{11}$ 20. $13\sqrt{2}$ 21. $\frac{76}{x}$ 22. $(-8-x) \cdot 5$ 23. 42 24. -11 25. $13x-12$ 26. $13x-5$ 27. $9x^2-3x-22$ 28. $8y-y^2$ 29. $3^5 = 243$ 30. $\frac{3}{2}$ 31. $5^2 = 25$</p>	<p>32. $\frac{2}{3}x^{15}$ 33. $\frac{1}{9x^{10}}$ 34. x^6y^{15} 35. $\frac{6x^2}{y^6}$ 36. $\frac{y^6}{4}$ 37. 6×10^{13} 38. 3×10^6 39. Add 17 40. Multiply by -7 41. Divide by 0.5 42. $x = 7$ 43. $x = 24$ 44. $x = 4$ 45. $x > 5$ 46. $x \leq -14$ 47. $x \geq -6$ 48. $x < -4$ 49. $x < 1$ 50. $x \geq 18$ 51. $x = 2$ 52. No real solution 53. x is any real number 54. $x = \pm 5$ 55. $x > 1$ 56. $x \geq -1$ 57. $x = 2$ 58. $x = -3$ 59. $x = 7$ 60. $a = 9$ $b = 15$</p>	<p>61. Quadrant 2 </p> <p>62. Quadrant 4 </p> <p>63. slope: -2 y-int: (0, 9)</p> <p>64. slope: $-\frac{3}{4}$ y-int: (0, 6)</p> <p>65. slope: $\frac{1}{7}$ y-int: $(0, \frac{1}{2})$</p> <p>66. </p>
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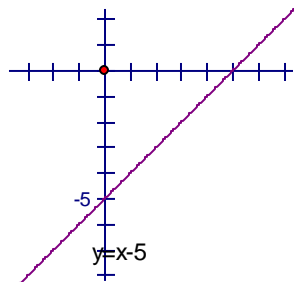
67.



x -int: $(5, 0)$

68.

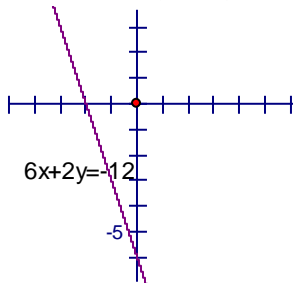
y -int: $(0, -5)$



x -int: $(-2, 0)$

69.

y -int: $(0, -6)$



GCF: $-2x$

70.

$$-2x(x^2 + 10x - 7)$$

GCF: $3x^2y^2$

71.

$$3x^2y^2(x^3 - 7y^5)$$

GCF: $5x^2$

72.

$$5x^2(3x^3 - 2x^2 + 1)$$

GCF: $-xy^3$

73.

$$-xy^3(2x - 7y^4)$$

74.

$$(x + 2)(x + 1)$$

75.

$$(x - 6)(x - 6)$$

76.

$$(x - 8)(x + 6)$$

77.

$$(x + 8)(x - 5)$$

78.

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

79.

$$(3x + 4)(3x + 4)$$

80.

$$(3x + 7)(x - 8)$$

81.

$$2(2x + 9)(3x - 2)$$

82.

$$(4x - 9)(4x + 9)$$

83.

$$(x + 10)^2$$

84.

$$(12 - x)(12 + x)$$

85.

$$x^3(x - 3)(x + 3)$$

86.

$$x(x + 4)(x + 7)$$

87.

$$-3x(x + 4)(x + 1)$$