Algebra II Honors

Students entering Algebra II Honors should be able to:

1. Solve multi-step algebraic equations with variables in the numerator or denominator

2. Solve literal algebraic equations for a variable

3. Solve a system of equations using graphing, substitution, or elimination

4. Factor binomials using greatest common factor and difference of perfect squares

5. Factor trinomials with a greatest common factor and coefficient $a \geq 1$ into two binomials

6. Factor four-term polynomials using grouping

7. Solve quadratic equations using factoring or the quadratic formula

8. Write the equation of a line in Slope-Intercept and/or Standard Form from a point and a slope or two points

9. Write the equation of a perpendicular or parallel line in Slope-Intercept or Standard Form

10. Apply the laws of exponents to simplify expressions

11. Perform the four basic operations on polynomials

12. Simplify radicals

13. Perform the four basic operations on radicals including rationalizing the denominator

14. Use special right triangle ratios to find the missing sides of triangles

15. Use right triangle trigonometric ratios to find missing sides and angles of triangles

Name: _____ **Date:** _____

Trumbull High School
Algebra II Honors Summer Packet

****Due the second day of school – will be counted as the first homework assignment****

Solve the system of equations:

1. $5x + 4y = 6$

   $-2x - 3y = -1$

2. $-2x + y = 8$

   $y = -3x - 2$

3. $-x + 2y = 11$

   $-2y + 3x = -13$

4. $3x - 2y = 5$

   $-6x = -4y + 7$

Solve each linear equation:

5. $-4(3 - x) = 2(x + 6)$

6. $2(3x + 6) + 8 = 6x$

7. $3(4 - 2x) = 12 - 3x$

8. $3x - 2(x + 1) = 0$

9. $3(x + 2) + 1 = 2x + 7 + x$

10. $\frac{4x+5}{-3} = \frac{3x-6}{2}$

Solve each equation for the indicated variable:

11. $2x - 6y = 12$ for y

12. $V = \frac{4}{3}\pi r^3$ for r

Factor each polynomial:

13. $x^2 - x - 72$

14. $7x^3 - 4x^2 + 8x$

15. $a^2 + 20a + 64$

16. $10m^3n^2 - 15m^2n + 25m$

17. $2x^2y - 4xy - 30y$

18. $x^2 - 64$

19. $2x^2 - 9x - 5$

20. $x^2 + 12x + 36$

21. $6b^2 - 8b - 30$

22. $m^4 - n^4$

23. $8g^2 - 22gh + 15h^2$

24. $25w^2 + 49v^2$

25. $wz - 18 + 6z - 3w$

26. $x^2y^2 - 25y^2 + x^2 - 25$

Solve each quadratic equation:

27. $r^2 + 10r - 9 = 0$

28. $p^2 + 6p = 0$

29. $x^2 - 3x = 10$

30. $5m^2 = 7m$

31. $(2c + 1)(c + 3) = 0$

32. $y^2 = 4y + 32$

33. $2x^2 - 3x - 2 = 0$

34. $d^2 + 5d - 1 = 0$

Write the equation of the line in standard form:

35. through (0 ,1) with slope -1

36. through $(2,3), m=-\frac{4}{3}$

37. perpendicular to $y=\frac{2}{5}x-4$ through $(3,3)$

38. vertical through $(5,4)$

39. parallel to $x=8$ through $(7,12)$

40. through $(3,4)$ and $(2,-4)$

41. parallel to $y=-16$ through $(3,-7)$

42. through $(3,-1)$, $m=0$

43. with - intercept 6, y- intercept 7

44. through $(2,3)$ and $(7,-2)$

Simplify each of the following:

45. $(-3x^2-4x+7)+(2x^2-7x+8)$

46. $\frac{64x^3y^2-16x^2y^3+32x^5y^5}{8x^2y^2}$

47. $(39a^4-4a^3+2a^2-a-7)-(10a^4+3a^3-2a^2-a+8)$

48. $2x^2z(3x-2z)$

49. $-3xy^3(x-2y)$

50. $(3x^2-x+1)(2x+5)$

51. $\frac{10a^3b^2c^7}{5a^5bc^7}$

52. $(8a^3b^2)(2a^{-4}b^{-5})$

53. $(15m^3n^2)^0$

54. $(2x-7)^2$

55. $(3x-7)(2x+9)$

56. $\dfrac{3x^6y^7}{27x^{-3}y^8}$

57. $(-3x^5y^6)^3$

58. $\left(2a^4b^{-3}c^{-2}\right)\left(3a^{-5}b^{-1}c^3\right)^2$

59. $\left(\dfrac{4f^2g^{-3}h}{2f^{-3}g^{-6}h^{-4}}\right)^{-3}$

60. $\dfrac{1}{2}\left(4x^3y^{-4}z^{-6}\right)^4$

61. $\left(\dfrac{12m^{-20}n^{-35}p}{22m^{56}n^{48}p^{-16}}\right)^2$

62. $9d^{-2}k^4\left(-3c^{-4}d^{-3}k^{-2}\right)^{-5}$

Simplify the following using exact answers, no decimals:

63. $\sqrt{32}$

64. $\sqrt{\frac{3}{5}}$

65. $\sqrt{\frac{5}{8}}$

66. $\sqrt{48x^5y^8}$

67. $\sqrt{8}+\sqrt{18}-\sqrt{32}$

68. $\sqrt{21}\cdot\sqrt{14}$

69. $\left(4\sqrt{3}\right)\left(-6\sqrt{6}\right)$

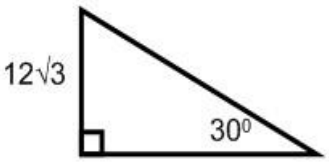
70. $\dfrac{3\sqrt{15}}{4\sqrt{3}}$

71. $\left(x-3\sqrt{3}\right)^2$

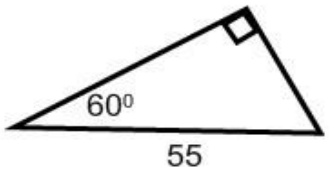
72. $\dfrac{4\sqrt{3}-\sqrt{2}}{\sqrt{2}}$

Use special right triangle ratios to find the missing sides.

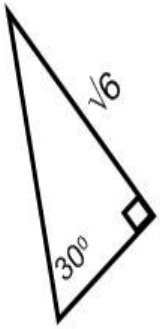
73.



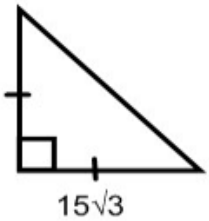
74.



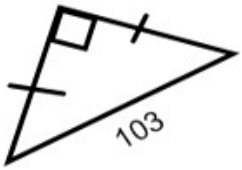
75.



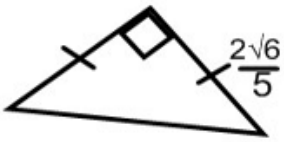
76.



77.

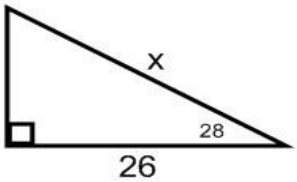


78.

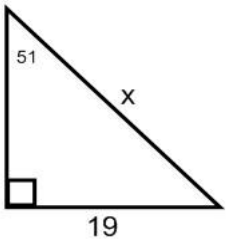


Use right triangle trigonometry (sine, cosine, tangent) to find the value of the variable.

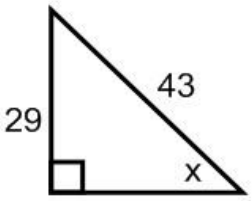
79.



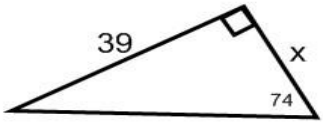
80.



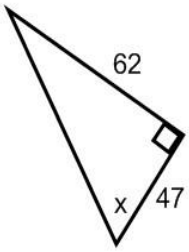
81.



82.



83.



84.