

SUMMER ASSIGNMENT FOR ALGEBRA II/TRIGONOMETRY

This summer assignment is designed to ensure that you are prepared for Algebra II/ Trigonometry. Nothing on this summer assignment is new. Everything is a review of topics you learned in Algebra I and Geometry.

If you want to be successful during Algebra II/Trig, you **must** be able to understand and apply this information throughout the year. This assignment may be completed with another student but be certain that **YOU** understand how to complete every problem. Neatly show all work for each problem to receive **FULL** credit. Graphing calculators should **NOT** be used. Be sure to check answers.

This packet is due the 2nd week of school. It will be graded based on completion, work shown, accuracy and turning in on time. There will be a quiz on this material.

Topic 1 - Numeric and Algebraic Expressions

<http://www.khanacademy.org/math/arithmetric/#order-of-operations>

Extra Practice: <http://regentsprep.org/REgents/math/ALGEBRA/AOP2/orderPrac.htm>

<http://www.khanacademy.org/math/algebra/ck12-algebra-1/v/variable-expressions>

Extra Practice: <http://regentsprep.org/REgents/math/ALGEBRA/AOP2/evalPrac.htm>

Simplify expressions, using order of operations.

1. $\frac{3}{8} \cdot 32 - 2^2 + 1$

2. $3(x - 8) - 2(x + 5)$

3. $6 - 4^3 \div 12 + 8 \div 6$

4. $\frac{2 - 5 \cdot 3}{-13 + 10}$

5. $-3 \cdot 6 - 4 \div 4$

6. $[3 - (-6 - 1)^2] \div 2$

Evaluate the expression.

7. $-3x^2 + 4x$ when $x = -2$

8. $\frac{-2(y+1)}{16-2y^2}$ when $y = 4$

9. $-2b^2 + 4ab$ when $a = 3, b = -1$

Topic 2- Fractions

http://www.khanacademy.org/math/arithmetric/fractions/Adding_and_subtracting_fractions/v/adding-fractions-with-unlike-denominators

http://www.khanacademy.org/math/arithmetric/fractions/multiplying_and_dividing_frac/v/multiplying-fractions

http://www.khanacademy.org/math/arithmetric/fractions/multiplying_and_dividing_frac/v/dividing-fractions-example

Evaluate each expression.

10. $\left(\frac{13}{7}\right) - \left(-\frac{9}{14}\right)$

11. $\frac{17}{12} + \frac{19}{15}$

12. $(-9) - \left(\frac{18}{13}\right)$

13. $10 \cdot \frac{3}{4}$

14. $\frac{2}{10} \cdot \frac{5}{7}$

15. $7 \div \frac{-3}{4}$

Topic 3- POLYNOMIALS

A polynomial is either a monomial or the sum of monomials. Each monomial in the polynomial is called a **term** of the polynomial. The **degree** of a polynomial is the degree of the monomial of the greatest degree. You can simplify polynomials with like terms by using the distributive property, by adding or subtracting like terms or by using the FOIL method.

Example: Simplify: $3x^2y + 2xy^3 + 6y + 5xy^3 - 8x^2y$

$$\begin{aligned} \text{First, group like terms: } & 3x^2y + 2xy^3 + 6y + 5xy^3 - 8x^2y + 8y \\ & = (3x^2y - 8x^2y) + (2xy^3 + 5xy^3) + 6y \\ & = -5x^2y + 7xy + 6y \end{aligned}$$

Simplify.

$$16. (-4m^2 - 6m) - (6m + 4m^2)$$

$$17. 15x^2y^3 + 8x^4y + 7x^2y^3$$

$$18. 5a(7a^2b^2 + 6ac - 8ac)$$

$$19. 3(2a + 5c) - 2(4a - 6c)$$

Topic 4 - Solving Equations and Inequalities

<http://www.khanacademy.org/math/algebra/solving-linear-equations/v/two-step-equations>

Extra Practice : <http://regentsprep.org/REgents/math/ALGEBRA/AOP2/evalPrac.htm>

<http://www.khanacademy.org/math/algebra/solving-linear-inequalities/v/one-step-inequalities-2>

<http://www.khanacademy.org/math/algebra/solving-linear-inequalities/v/multi-step-inequalities-2>

Extra Practice: <http://regentsprep.org/REgents/math/ALGEBRA/AE8/PSolvIn.htm>

Solve the equations.

$$20. -2(4x - 7) = 3(x - 10)$$

$$21. 2a - 6 - (3a + 4) = 10 - 4a$$

$$22. \frac{1}{9} - \frac{2}{3}b = \frac{1}{18}$$

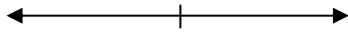
$$23. \frac{5}{8} + \frac{3}{4}x = \frac{1}{16}$$

$$24. \frac{3}{11}a - 1 = \frac{7}{11}a + 9$$

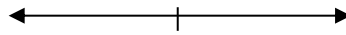
Solve the inequality and graph the solution.

REMINDER: When you multiply or divide each side of an inequality by a negative number, you must reverse the inequality symbol.

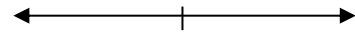
25. $-2 + y > 31$



26. $k - 7k > 2k + 9$



27. $2r - 5 \leq 4r - 2$



Check whether the given number is a solution of the inequality.

28. $4(x + 3) > 20; 2$

29. $3p - 7 < p; 3$

Topic 5 - Multiplying and Squaring Binomials

<http://www.khanacademy.org/math/algebra/polynomials/v/multiplying-binomials>

Simplify

30. $(n + 3)(n - 3)$

31. $(5g + 2)(g - 7)$

32. $(12 - 5p)(2p + 9)$

Find the product by squaring the binomial.

REMINDER: $(a + b)^2 = (a + b)(a + b)$

33. $(m + 6)^2$

34. $(9 - e)^2$

35. $(n - 2)^2$

36. $(q - 3)^2$

Topic 6- Factoring

<http://www.khanacademy.org/math/algebra/polynomials/v/factoring-quadratic-expressions> <http://www.khanacademy.org/math/algebra/polynomials/v/factoring-difference-of-squares> <http://www.khanacademy.org/math/algebra/polynomials/v/factoring-perfect-square-trinomials> <http://www.khanacademy.org/math/algebra/polynomials/v/factoring-trinomials-with-a-common-factor>

Factoring:

Always look for a greatest common factor *first*:

$$a^2b + ab = ab(a + 1)$$

Perfect Square Trinomials: $a^2 - 2ab + b^2 = (a - b)^2$

$$\text{or } a^2 + 2ab + b^2 = (a + b)^2$$

Difference of Squares: $a^2 - b^2 = (a - b)(a + b)$

Sum of Cubes: $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

Difference of Cubes: $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

Factor the following expressions.

37. $6xy^2 - 4x^2y$

38. $a^2 - 3a - 10$

39. $18m^3 - 8mn^2$

40. $ax - ay + bx - by$

41. $x^2 - 8x + 15$

42. $128m^3 + 2n^3$

43. $2ax + 6ay + bx + 3by$

44. $2x^2 + 5x + 3$

45. $8x^3 - 27$

46. $4y^2 - 23y + 15$

47. $8x^2 - 10x - 3$

48. $4x^3 - x$

Topic 7: Solving Quadratic Equations

<http://www.khanacademy.org/math/algebra/ck12-algebra-1/v/solving-quadratic-equations-by-square-roots>

<http://www.khanacademy.org/math/algebra/polynomials/v/solving-a-quadratic-by-factoring>

Extra Practice: <http://regentsprep.org/REgents/math/ALGEBRA/AE5/PFacEq.htm>

Quadratic Formula:

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Solve the following quadratic equations showing the requested method. Simplify when possible.

49. Solve by factoring: $2x^2 - 3x - 2 = 0$

50. Solve by quadratic formula:
 $x^2 = 11x$

51. Solve by factoring: $y^2 - 2y + 1 = 0$

52. Solve by quadratic formula:
 $2x^2 + 5x - 1 = 0$

53. Solve by factoring: $x^2 - 16 = 0$

54. Solve by quadratic formula:
 $3y^2 - 2y - 5 = 0$

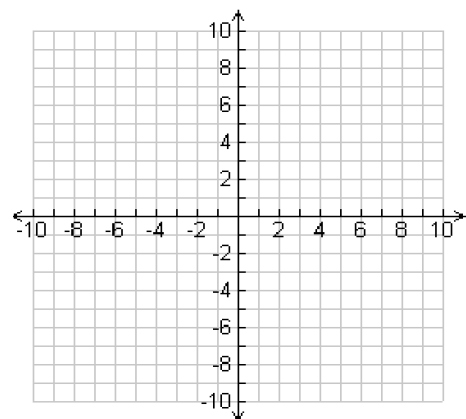
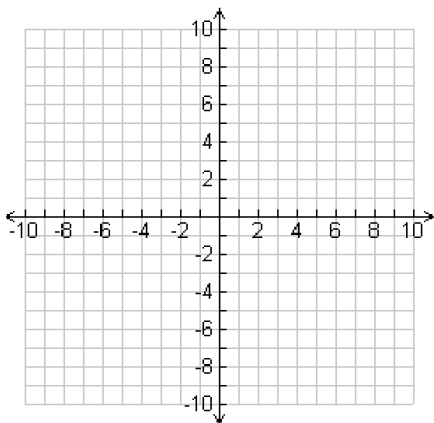
Topic 8 - Linear Equations

<http://www.khanacademy.org/math/algebra/ck12-algebra-1/v/graphing-using-intercepts>

Use the x-intercept and the y-intercept to graph the equation. Label the points where the line crosses the coordinate axes.

55. $2x + y = -4$ x-intercept = (____, 0)
y-intercept = (0, ____)

56. $y - 4x = 6$ x-intercept = (____, 0)
y-intercept = (0, ____)



Topic 9-System of Equations

<http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/v/substitution-method-2>

Solve the system of linear equations.

57. Solve the system using substitution:

$$2x + y = 5$$

$$x + 3y = 5$$

58. Solve the system using elimination:

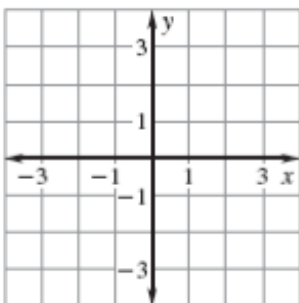
$$x - 3y = -5$$

$$2y + 3x + 4 = 0$$

Graph each system. Don't forget to shade!

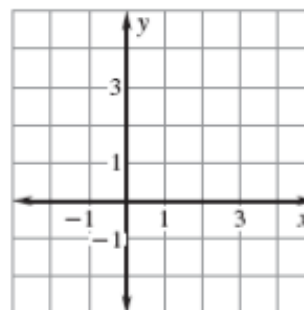
59. $3x + y < 0$

$$4x - y \leq 1$$

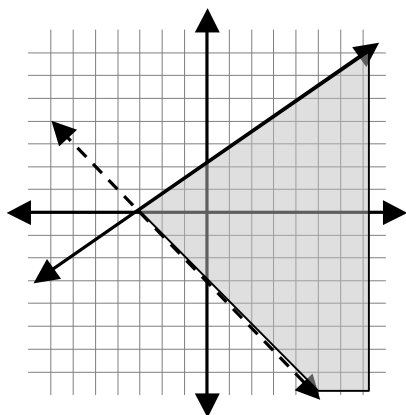


60. $x \geq y + 2$

$$2x + y < 4$$



61. Circle all the points that are solutions to the system graphed below?



A. (-3, 0)

B. (-5, 8)

C. (1, 3)

D. (3, 4)

E. (2, -4)

F. (0, 0)

Topic 10-PROPERTIES OF EXPONENTS

Extra Practice: <http://regentsprep.org/REgents/math/ALGEBRA/AO5/PracExp.htm>

PRODUCT OF POWERS PROPERTY

$$a^m \bullet a^n = a^{m+n}$$

POWER OF A POWER PROPERTY

$$(a^m)^n = a^{mn}$$

POWER OF A PRODUCT PROPERTY

$$(ab)^m = a^m b^m$$

NEGATIVE EXPONENT PROPERTY

$$a^{-m} = \frac{1}{a^m}, a \neq 0$$

ZERO EXPONENT PROPERTY

$$a^0 = 1, a \neq 0$$

QUOTIENT OF POWERS PROPERTY

$$\frac{a^m}{a^n} = a^{m-n}, a \neq 0$$

POWER OF A QUOTIENT PROPERTY

$$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}, b \neq 0$$

Simplify the expressions using the properties of exponents. The simplified expression should have no negative exponents.

62. $2x^{10} \bullet x^{-3}$

63. $\frac{1}{g^{-11}}$

64. $\left(\frac{x^3}{x^7}\right)^5$

65. $5y^{-2} \times 10y^{-5}$

66. $4w \div 2w^3$

67. $(4h)^2 \div (16h)^0$

68. $(d^4)^2$

69. $p^{\frac{5}{4}} \div p^{\frac{1}{4}}$

Topic 11 – Simplifying Radicals

<http://www.khanacademy.org/math/arithmetic/exponents-radicals/radical-radicals/v/simplifying-radicals>

Simplify.

70. $\sqrt{90}$

71. $\sqrt{20t^6h^3s^5}$

72. $\sqrt{12} \bullet \sqrt{4y^3}$

73. $\frac{2}{\sqrt{8}}$

74. $2\sqrt{16}$

75. $6\sqrt{500}$

List the
perfect
squares from
4 to 144!

$2^2 = \underline{\quad}$

$3^2 = \underline{\quad}$

$4^2 = \underline{\quad}$

$5^2 = \underline{\quad}$

$6^2 = \underline{\quad}$

$7^2 = \underline{\quad}$

$8^2 = \underline{\quad}$

$9^2 = \underline{\quad}$

$10^2 = \underline{\quad}$

$11^2 = \underline{\quad}$

$12^2 = \underline{\quad}$