

Name: \_\_\_\_\_

**SUMMER ASSIGNMENT**  
**for students entering**  
**Advanced or Honors Geometry**

**OVERVIEW:**

The problems in this packet address **prerequisite** Algebra 1 skills. These are concepts which you should **understand fully** on your own **before** entering Advanced or Honors Geometry. If you need a refresher, please use the links provided. If you have difficulty or any gaps in your knowledge, you may wish to reconsider your placement at this level. Please contact your guidance counselor with any concerns.

**DIRECTIONS:**

- **This packet is due on the first day of school.**
- All problems should be done or well-attempted. No problems should be left blank.
- Show work on every problem in the space provided.
- Write neatly in pencil and box your final answers.
- Express all answers in exact, simplest form. (This means answers should not be written as repeating or rounded decimals; they should be written as fractions and simplified square roots.)
- You should not work together with other students nor receive extensive help from a tutor.
- An answer key will be shared with you the first week of school.

**ASSESSMENT:**

- This packet will be graded.
- You will have a quiz or test on these topics in the very beginning of the school year.
  - We will take minimal class time to review, and you will have the opportunity to ask questions in the days prior to the assessment.

**CALCULATOR INFORMATION:**

- Please purchase a **TI-83 Plus or TI-84 Plus graphing calculator.**
- You will need it in this class, as well as all subsequent high school and college courses.

**We look forward to meeting you in September!**

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**EVALUATING EXPRESSIONS**

*Evaluate each expression. Remember to apply the order of operations.*

For extra help, watch the following instructional videos from Khan Academy:

<https://www.khanacademy.org/math/algebra/introduction-to-algebra/variable-and-expressions/v/variables-and-expressions-1>

<https://www.khanacademy.org/math/algebra/introduction-to-algebra/variable-and-expressions/v/evaluate-a-formula-using-substitution>

1. Evaluate  $-x^2 - x + 3$  when  $x = -4$ .

2. Evaluate  $x^2 \div (x + 5)$  when  $x = -\frac{3}{2}$ .

## **SIMPLIFYING EXPRESSIONS**

*Simplify each expression by using the distributive property and combining like terms.*

For extra help, watch the following instructional videos from Khan Academy:

<http://www.khanacademy.org/math/algebra/ck12-algebra-1/v/distributive-property-example-1>

<http://www.khanacademy.org/math/algebra/polynomials/v/adding-and-subtracting-polynomials-2>

3.  $3x(y - 2x) - 2y(2x - 3y)$

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

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

6.  $(2x^2 - 5x + 7) - (3x^3 + x^2 + 2)$

## **WORKING WITH RADICALS**

*Simplify each radical expression. Do not give decimal answers; leave answers in simplest radical form.*

*Rationalize the denominator when necessary.*

For extra help, watch the following instructional videos from Khan Academy:

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

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

<http://www.khanacademy.org/math/algebra/exponents-radicals/v/how-to-rationalize-a-denominator>

7.  $\sqrt{98}$

8.  $(2\sqrt{5})^2$

9.  $4\sqrt{27} + 8\sqrt{48}$

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

11.  $\frac{3\sqrt{3}}{5\sqrt{2}}$

12.  $\sqrt{\frac{12}{25}}$

## **MULTIPLYING POLYNOMIALS**

*Find each product. Simplify the result as much as possible.*

For extra help, watch the following instructional videos from Khan Academy:

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

<http://www.khanacademy.org/math/algebra/polynomials/v/square-a-binomial>

13.  $(4n+3)(3n-4)$

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

15.  $(8-\sqrt{7})(1+\sqrt{7})$

16.  $(2x-y)^2$

## **FACTORING**

*Factor each expression completely. Decide which method(s) to use.*

For extra help, watch the following instructional videos from Khan Academy:

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

<http://www.khanacademy.org/math/algebra/polynomials/v/factoring-and-the-distributive-property-2>

<http://www.khanacademy.org/math/algebra/polynomials/v/factoring-trinomials-by-grouping-1>

<http://www.khanacademy.org/math/algebra/polynomials/v/factoring-trinomials-by-grouping-4>

<http://www.khanacademy.org/math/algebra/polynomials/v/factoring-difference-of-squares>

17.  $x^2 - 7x + 6$

18.  $2r^2 - 3r - 20$

19.  $6x^2 - 5x - 6$

20.  $3x^3 - 12x$

21.  $25y^2 - 1$

22.  $y^3 + 2y^2 - 81y - 162$

## **SOLVING EQUATIONS**

*Solve each linear equation. Do not give decimal answers. Leave answers as simplified fractions when necessary.*

For extra help, watch the following instructional videos from Khan Academy:

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

<http://www.khanacademy.org/math/algebra/ratios-proportions/v/solving-rational-equations-1>

23.  $5a + 2a - 6 = 4a - 5$

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

$$25. \frac{8-5r}{6} = 3$$

$$26. \frac{y+4}{y-1} = -\frac{4}{3}$$

*Solve each equation for the indicated variable.*

$$27. \text{ Solve for } y. \quad 4x - 2y = z$$

$$28. \text{ Solve for } m. \quad \sqrt{2m} = a + 3$$

*Solve each quadratic equation. Find all possible solutions.*

For extra help, watch the following instructional videos from Khan Academy:

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

<http://www.khanacademy.org/math/algebra/exponents-radicals/v/solving-radical-equations>

$$29. \quad 2n^2 - 50 = 0$$

$$30. \quad 3x^2 + x = 24$$

$$31. \quad \frac{x-4}{2x-7} = \frac{x+4}{3x+7}$$

$$32. \quad \frac{6-m}{m} = \frac{m-6}{2}$$

## **COORDINATE PLANE & GRAPHING**

**#33-35: Graph each linear function/equation. #36: Write its equation.**

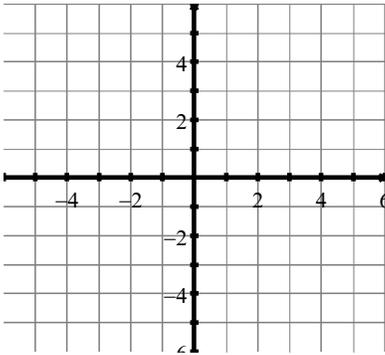
For extra help, watch the following instructional videos from Khan Academy:

<http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/v/graphing-a-line-in-slope-intercept-form>

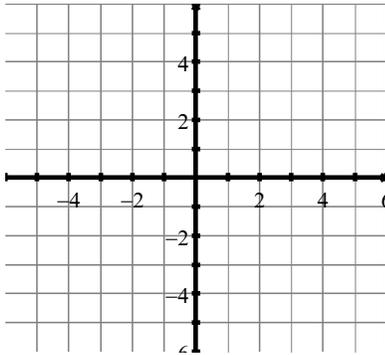
<http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/v/graphing-using-x-and-y-intercepts>

<http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/v/equation-of-a-line-3>

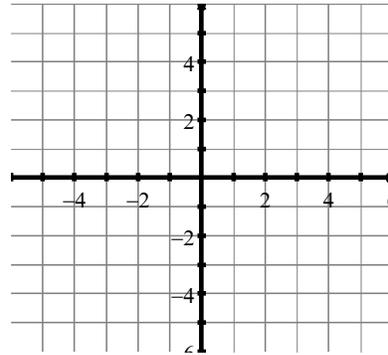
33.  $f(x) = -3x + 2$



34.  $3x - 2y = 10$



35.  $y = 2$



36. Write the equation of the line that passes through the points  $(-4, -1)$  and  $(2, -4)$ . Write the equation in slope-intercept form ( $y = mx + b$ ).

## **SYSTEMS OF LINEAR EQUATIONS**

***Solve each system by the indicated method. State the solution as an ordered pair.***

For extra help, watch the following instructional videos from Khan Academy:

<http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/v/solving-linear-systems-by-graphing>

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

<http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/v/solving-systems-of-equations-by-multiplication>

37. The substitution method

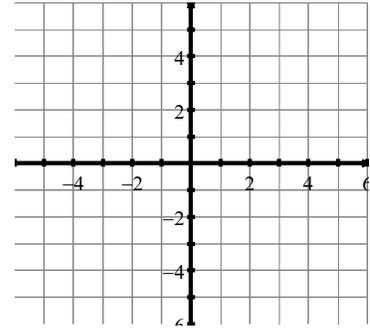
$$\begin{cases} x = y - 11 \\ x - 3y = 1 \end{cases}$$

38. The elimination (linear combination) method

$$\begin{cases} 6x - 5y = 9 \\ 9x - 7y = 15 \end{cases}$$

39. The graphing method

$$\begin{cases} 3x - y = -6 \\ x = -1 \end{cases}$$



### APPLICATIONS

Set up an equation and solve each problem algebraically.

40. The sum of 6 less than a number and 5 more than the same number is 9. Find the number.

41. 12 decreased by the square of a number is equal to 3. Find the number.

42. The length of a rectangle is 3 ft less than twice the width. If the area of the rectangle is  $54 \text{ ft}^2$ , find the dimensions of the rectangle. Solve by using a quadratic equation.

43. A mountain bike park has a total of 48 trails, 37.5% of which are beginner trails. The rest are divided evenly between intermediate and expert trails. How many of each kind of trail is there?

44. The perimeter  $P$  (in ft) of each of the two rectangles below is given. What are the values of  $c$  and  $d$ ? Solve by using a system of linear equations.

