

Algebra 2 Honors Summer Packet

The summer packet for Algebra 2 Honors is to be used as a tool to review the concepts from Algebra 1 needed to move forward in Algebra 2. The student should use the problems as a measure of their knowledge and retention. The problems should be done without a calculator. Then, if needed, use the Khan Academy links as a starting point for where to find additional information to watch videos and do further problems if they do not know the indicated skill.

The summer packet and all work is due the second full day of class. The content will be assessed within the first couple weeks of school.

Answer Key can be found at this link: <https://bit.ly/2Ka7vR9>

A) Order of operations

$$1) 4 - 5 - 6 + 9 \qquad 2) 8 \div 2 \times 6 \times (-3) \qquad 3) \\ - 4^2 - (-4)^2 + (6 - 9)^3 - [11 - (4 + |-5|)]$$

For more help go here:

<https://www.khanacademy.org/math/pre-algebra/pre-algebra-arith-prop/pre-algebra-order-of-operations/v/order-of-operations>

B) Sets of Real Numbers

Describe the following set of number. List 3 examples of each.

a) Real Numbers:

b) Rational Numbers:

c) Irrational Numbers:

d) Natural Numbers:

e) Whole Numbers:

f) Integers:

For more help go here:

<https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-numbers-operations/cc-8th-irrational-numbers/v/introduction-to-rational-and-irrational-numbers>

C) Set Notation

Let A={1, 2, 3, 7, 8, 9, 10}**and B**={8, 9, 10, 11, 12} **and C** = {4, 5, 6, 7}

1) $A \cap B$

2) $B \cup C$

3) $A \cup B \cup C$

4) $A \cap B \cap C$

5) $A \cap C \cup B$

For more help go here:

<https://www.khanacademy.org/math/statistics-probability/probability-library/basic-set-ops/v/intersection-and-union-of-sets>

D) Properties of Real numbers

Give a numeric example of each of the following properties of Addition and Multiplication.
(keyword: Use the properties themselves as keywords)

<u>Property</u>	<u>Example: Addition</u>	<u>Example: Multiplication</u>
Closure:		
Commutative:		
Associative:		
Identity:		
Inverse:		

The adding of a number and its inverse is always _____.

The multiplying of a number and its inverse is always _____.

For more help go here:

<https://www.khanacademy.org/math/pre-algebra/pre-algebra-arith-prop/pre-algebra-arithmetic-properties/v/order-doesn-t-matter-when-purely-multiplying>

E) Simplifying Algebraic Expressions

Simplify the following expressions for a) $x = 3$ and $y = 2$

b) $x = -3$ and $y = \frac{1}{2}$

1) $x^2 + 3y - 8$

2) $-x^2 - 8y - 11$

3) $3x^2 - x - 12$

4) $\frac{x+y}{x-y}$

5) $y(x+5) -$

$(-2 + x)$

For more help go here:

<https://www.khanacademy.org/math/algebra/introduction-to-algebra/alg1-manipulating-expressions/v/combining-like-terms>

F) Exponent Properties

1) $(5x^3)(2x^4)$

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

3) $(-2x^5)^4$

4) $(3x^2)^0(4x)$

5) $\frac{4x^7}{8x^4}$

6) 3^{-2}

7) $\frac{12x^3y^7}{8x^5y^2}$

For more help go here:

<https://www.khanacademy.org/math/pre-algebra/pre-algebra-exponents-radicals#pre-algebra-exponents>

G) Radicals

Simplify. Leave answers in exact form.

1) $\sqrt{256}$

2) $\sqrt{-64}$

3) $-\sqrt{16}$

4) $\sqrt{80}$

5) $6\sqrt{32}$

6) $\sqrt{5} \times \sqrt{2}$

7) $3\sqrt{6} \cdot 2\sqrt{8}$

8) $(-5\sqrt{2})(3\sqrt{18})$

9) $2\sqrt{5} - 8\sqrt{5}$

10) $3\sqrt{2} + 11\sqrt{2}$

11) $-6\sqrt{75} + 2\sqrt{48}$

12) $3\sqrt{20} + \sqrt{25}$

For more help go here:

<https://www.khanacademy.org/math/algebra-home/alg-exp-and-log/miscellaneous-radicals/v/adding-and-simplifying-radicals>

<https://www.khanacademy.org/math/algebra-home/alg-exp-and-log/miscellaneous-radicals/v/subtracting-and-simplifying-radicals>

<https://www.khanacademy.org/math/algebra/rational-exponents-and-radicals/alg1-simplify-square-roots/v/simplifying-square-root-expressions>

F) Polynomials

a) Perform the indicated operation and write the answer in standard form (descending order)

b) Determine the degree of the polynomial

c) Classify the polynomial by number of terms.

1) $3x^4 + 5x^4$

2) $(3x^4)(5x^4)$

3) $(x^3 - 8) + (2x^3 - 5x^2 - 9)$

4) $(6x^2 - 8x - 5) - (7x^3 - 3x + 7)$

5) $(4x^2 + 7x - 10) - (-x^2 + 8x - 5)$

6) $2(3x + 5) - 6(x - 2)$

7) $(x + 5)(x + 2)$

8) $(4x - 5)(6x + 1)$

9) $(x + 8)(x - 8)$

10) $(3x + 7)(3x - 7)$

11) $(x + 5)^2$

12) $(3x - 8)^2$

For more help go here:

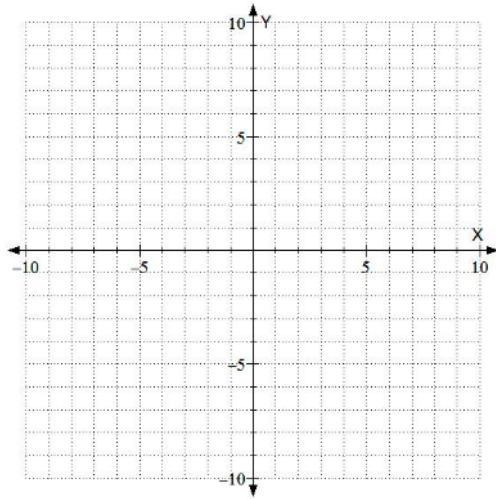
<https://www.khanacademy.org/math/algebra/introduction-to-polynomial-expressions>

<https://www.khanacademy.org/math/algebra/introduction-to-polynomial-expressions/introduction-to-polynomials/v/terms-coefficients-and-exponents-in-a-polynomial>

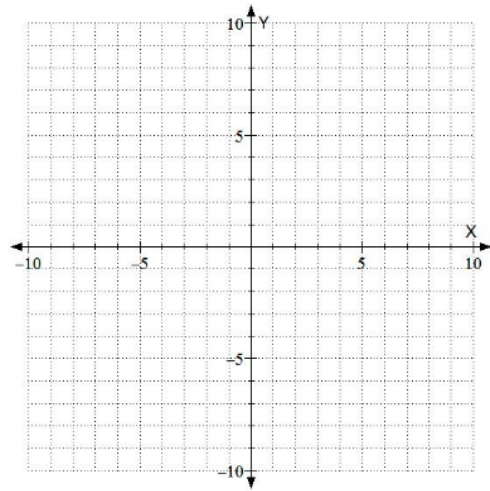
G) Graphing Lines

Graph:

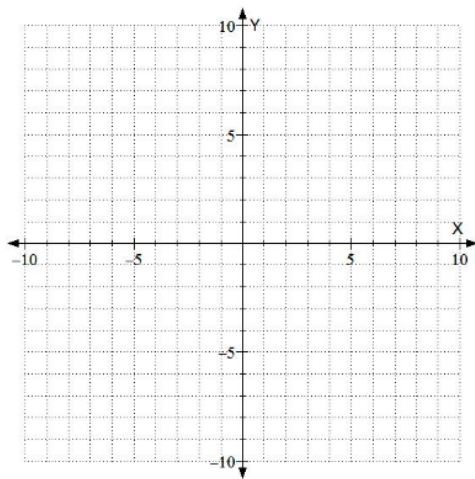
1) $x = 4$



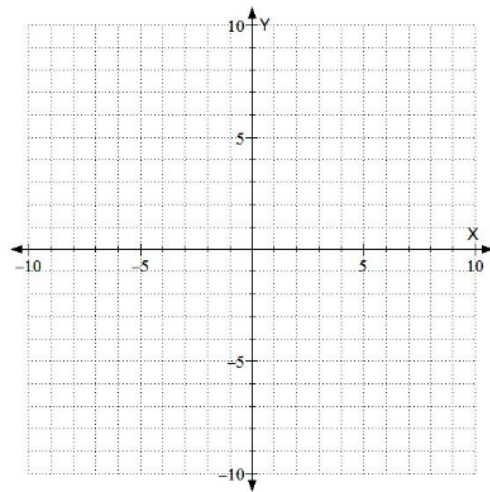
2) $y = -2$



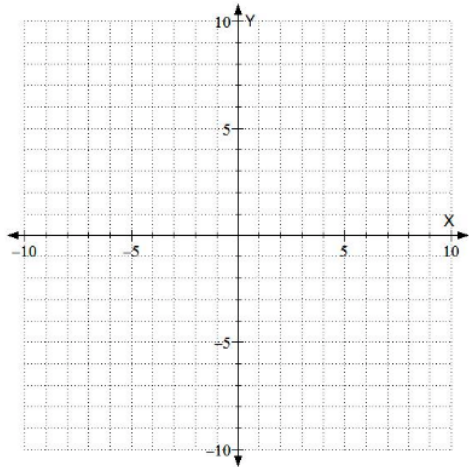
3) $y = 2x + 1$



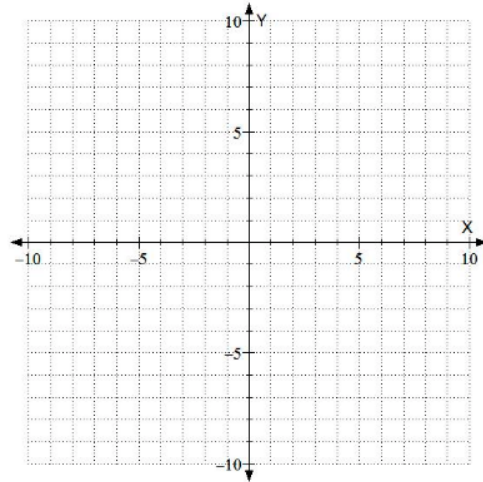
4) $y = -3x - 2$



5) $y = \frac{3}{5}x + 1$

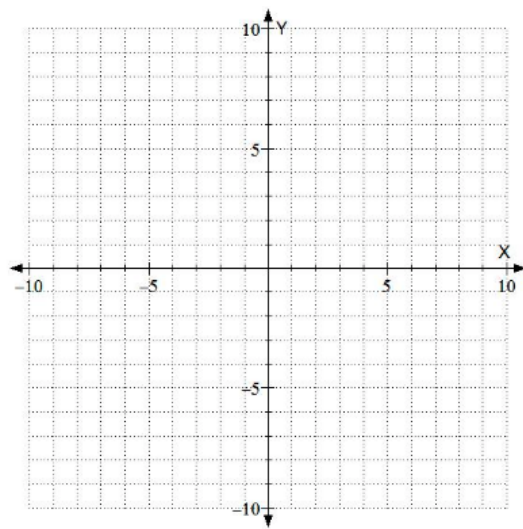
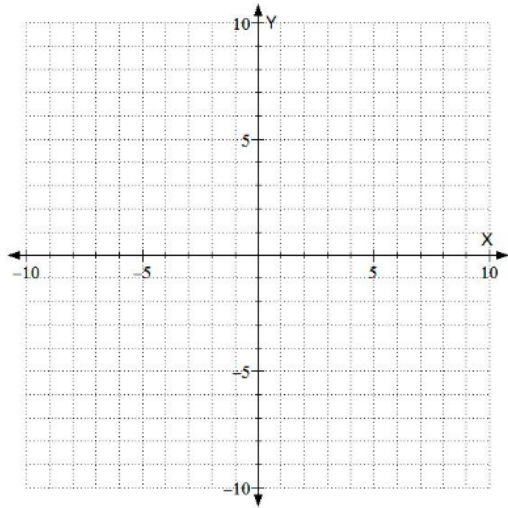


6) $y = -\frac{2}{3}x - 4$

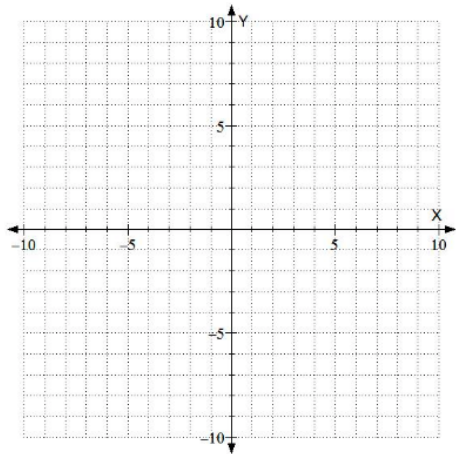


7) $y = x$

8) Graph using x and y intercepts: $3x - 2y = 12$



9) Graph using x and y intercepts: $2y = 14x + 7$



For more help go here:

<https://www.khanacademy.org/math/algebra/two-var-linear-equations>

H) Solving Linear Equations

Solve: Simplify all solutions. Leave non-integer answers as reduced improper fractions.

$$1) 7x - 29 = -15$$
$$7x - 18 = 4x - 31$$

$$2) 3(4x - 15) = 19$$

3)

$$4) 4 + 6(x + 2) = 2 - (x - 3)$$
$$\frac{3}{4}(x - 2) = x + 1$$

$$5) \frac{7}{2}x - 1 = 2x + 5$$

6)

$$7) \frac{1}{2}x - \frac{5}{3} = -\frac{2}{3}x + \frac{19}{4}$$

$$8) -\frac{2}{3}\left(\frac{6}{5}x - \frac{7}{10}\right) = \frac{17}{20}$$

For more help go here:

<https://www.khanacademy.org/math/algebra/one-variable-linear-equations>

I) Absolute Value Equations

Solve:

$$1) |x| = 8$$

$$2) |x| = -9$$

$$3) |x - 9| = 8$$

$$4) 2|3x - 5| = 20$$

$$5) \frac{1}{2}|x + 3| - 4 = 1$$

For more help go here:

<https://www.khanacademy.org/math/algebra-home/alg-absolute-value/alg-absolute-value-equations/v/absolute-value-equations>

J) Inequalities

Solve. Then graph all solutions on a number line.

1) $4x + 5 > 25$
 $3x + 8 < 5x - 12$

2) $7 - n \leq 19$

3)

4) $-1 \leq x + 5 < 8$

5) $-16 < 3x - 4 \leq 2$

6) $3 \leq \frac{2}{3}x - 4 < 5$

7) $3x < 12$ or $x+4 > 15$

8) $4x > 16$ or $2x - 8 < 4$

9) $|x| \leq 6$

10) $|x| > 5$

11) $|x| < -2$

12) $|x| > -3$

$$13) |x - 9| \geq 4$$

$$14) |3x + 1| < 7$$

$$15) 3|x - 4| + 2 \leq 11$$

For more help go here:

<https://www.khanacademy.org/math/algebra/one-variable-linear-inequalities>

<https://www.khanacademy.org/math/algebra-home/alg-absolute-value/alg-absolute-value-inequalities/v/absolute-value-inequalities>