

Welcome to Algebra 2 Honors!

On the following pages, you will find your summer assignment for the upcoming school year.

Note to the Student:

The purpose of this assignment is to review topics that are essential to your success in Algebra 2 Honors. It will be assumed that all the topics covered in this assignment, and in your previous math courses, have been mastered and will not need explanation as we use them in the Algebra 2 Honors course.

- The packet is to be completed *with all work shown and directions followed*, and is due on the first day of school. You may print this packet (and turn it in on paper) or complete it electronically on your iPad using Notability.
- To help you review and complete your packet, there are videos corresponding to sections of the packet. These videos may be accessed on any web-connected device with any web browser.
- Each video shares the identical title to the corresponding section in the summer packet. For the Khan Academy videos, you will find practice problems on the same webpage so that you can practice and get feedback.

I hope you have a great summer and look forward to seeing you in the fall!

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Using the Quadratic Formula

Standard:
AR. 3.8

Solve each equation using the Quadratic Formula. Show all work.

Write as *exact* answers (leave in **radical** form). Box all answers.

Click [HERE](#) to watch a helpful video.

1. $3x^2 + 5x + 1 = 0$

3. $10 = -4x + 3x^2$

2. $0 = -6x^2 - 3x + 6$

4. $3x^2 - 4x - 8 = -6$

Writing a Quadratic Equation Given the Roots

Write a quadratic equation in standard form with the given roots.

Show all work. Box all answers.

Click [HERE](#) to watch a helpful video.

Standard:

AR. 1.1

1. $5, 6$

3. $\frac{1}{6}, 5$

2. $-4, 2$

4. $-\frac{2}{3}, 5$

Solving Quadratic Word Problems

Solve each problem. Show all work. Place answers in the boxes provided.

Click [HERE](#) to watch a helpful video.

Standards:

AR. 3.6

AR.3.8

1.

An object is launched from a platform.

Its height (in meters), x seconds after the launch, is modeled by

$$h(x) = -5(x + 1)(x - 9)$$

What is the height of the object at the time of launch?

meters

3.

Amir stands on a balcony and throws a ball to his dog, who is at ground level.

The ball's height (in meters above the ground), x seconds after Amir threw it, is modeled by

$$h(x) = -(x + 1)(x - 7)$$

What is the maximum height that the ball will reach?

meters

2.

The power generated by an electrical circuit (in watts) as a function of its current x (in amperes) is modeled by

$$P(x) = -15x(x - 8)$$

What current will produce the maximum power?

amperes

4.

A certain company's main source of income is a mobile app.

The company's annual profit (in millions of dollars) as a function of the app's price (in dollars) is modeled by

$$P(x) = -2(x - 3)(x - 11)$$

Which app prices will result in \$0 annual profit?

Enter the lower price first.

Lower price: dollars

Higher price: dollars

Writing Linear Equations from Graphs

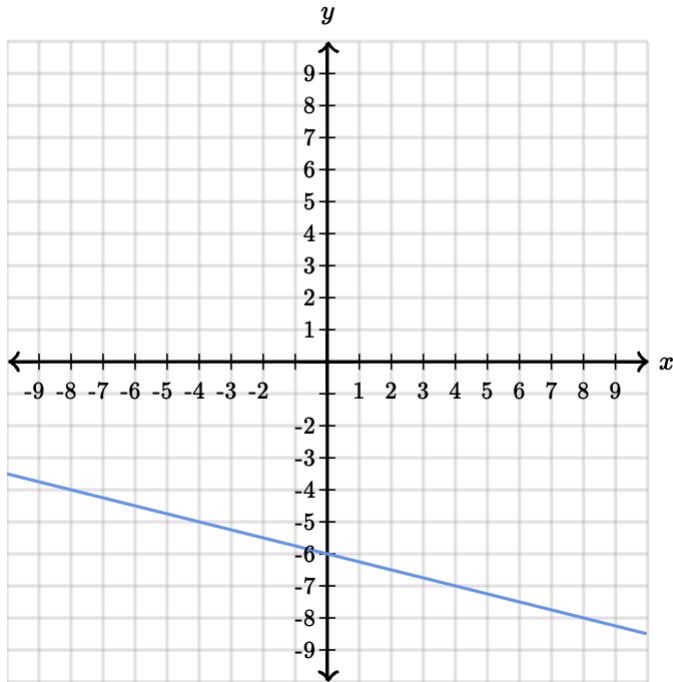
For each graph write an equation in slope intercept form *Use exact numbers.*

Place answers in boxes provided.

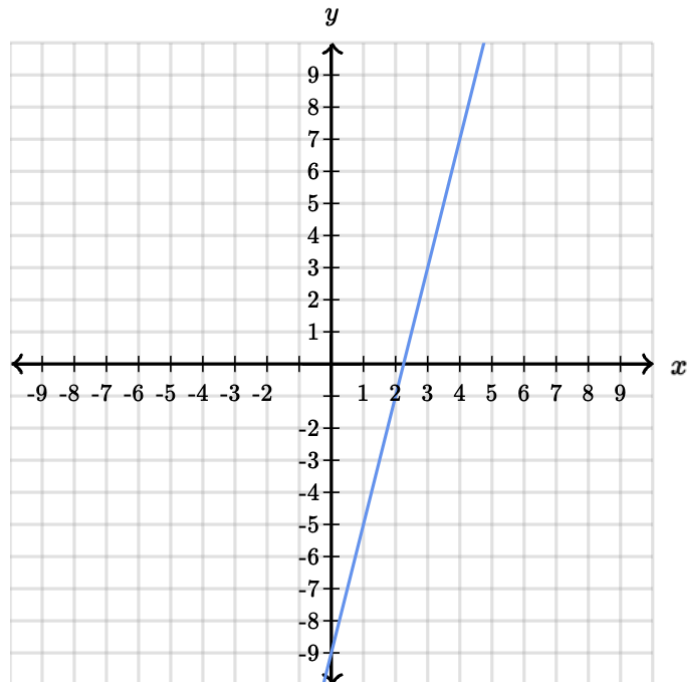
Click [HERE](#) to watch a helpful video.

Standard:
AR. 2.2

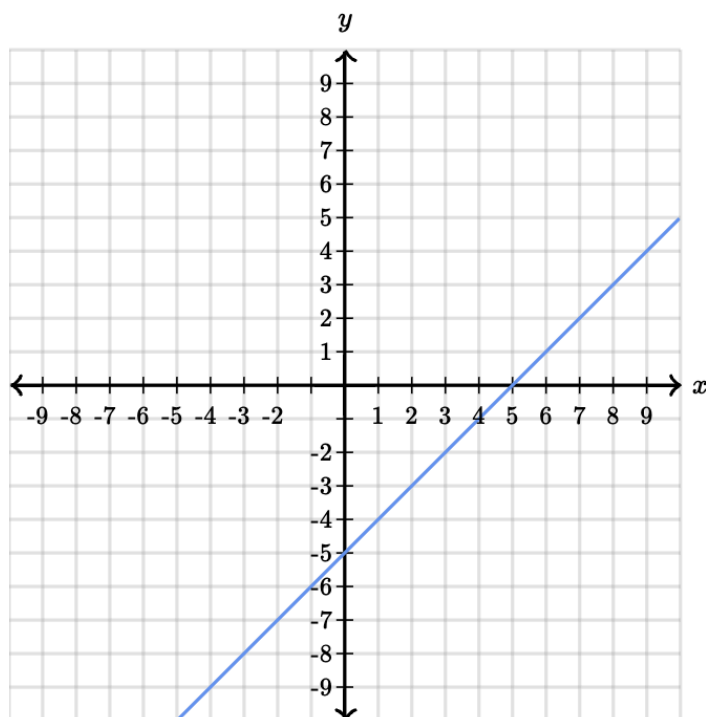
1. $y = \boxed{}x + \boxed{}$



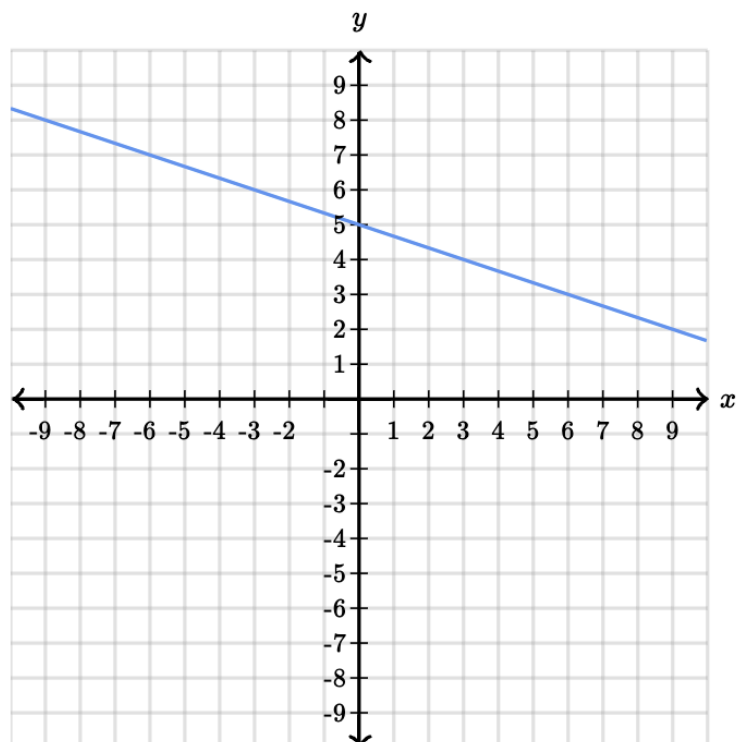
3. $y = \boxed{}x + \boxed{}$



2. $y = \boxed{}x + \boxed{}$



4. $y = \boxed{}x + \boxed{}$



Adding and Subtracting Polynomials

Simplify the expressions. Box all answers.

Click [HERE](#) to watch a helpful video.

Standard:

AR. 1.3

1. $(5h^3 - 8h) + (-2h^3 - h^2 - 2h)$

3. $6c^2 - 2c - 1 - 4c^2 + 7c + 5$

2. $(-w^3 + 8w^2 - 3w) - (4w^2 + 5w - 7)$

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

Writing and Solving Equations

Standard:
AR. 2.1

Answer both parts to each problem. Place answers in boxes provided.
Show work.

Click [HERE](#) to watch a helpful video.

1.

Roger gets \$40 per day as wages and \$4.50 as commission for every pair of shoes he sells in a day. His daily earnings goal is \$112.

Write an equation to determine how many pairs of shoes, p , Roger must sell in a day to meet his daily earnings goal.

Find the number of pairs of shoes he must sell to meet his daily earnings goal.

pairs of shoes

2.

Cookies are on sale! Today each cookie costs \$0.75 less than the normal price. Right now if you buy 7 of them it will only cost you \$2.80!

Write an equation to determine the normal price of each cookie (c).

Find the normal price of each cookie.

\$

3.

Floyd is an aspiring music artist. He has a record contract that pays him a base rate of \$200 a month and an additional \$12 for each album that he sells. Last month he earned a total of \$644.

Write an equation to determine the number of albums (a) Floyd sold last month.

Find the number of albums Floyd sold last month.

albums

4.

In winter, the price of apples suddenly went up by \$0.75 per pound. Sam bought 3 pounds of apples at the new price for a total of \$5.88.

Write an equation to determine the original price per pound (p).

Find the original price per pound.

\$

Writing Equations of Parallel and Perpendicular Lines

Standard:
AR. 2.3

Write an equation in slope-intercept form for the line that satisfies each set of conditions.

Box all answers.

Click [HERE](#) to watch a helpful video. Click [HERE](#) to watch another helpful video.

1. passes through (1, 2), parallel to $y = 4x - 3$.

3. passes through (-6, -6), parallel to $y = \frac{4}{3}x + 8$.

2. passes through (-3, 5),
perpendicular to $y = \frac{2}{3}x - 8$.

4. passes through (10, 2),
perpendicular to $y = 4x + 6$.

Manipulating Formulas

Rearrange the formulas to solve for the variable that is given. Place answer in box provided.

Show work.

Click [HERE](#) to watch a helpful video. On this webpage are two other helpful videos.

- 1 The following formula gives the area A of a trapezoid, where b and c are the bases of the trapezoid and h is the height:

$$A = \frac{1}{2}(b + c)h$$

Rearrange the formula to highlight the height.

$h =$

- 2 The following formula is used in economics to find a company's net income N , where P is the sales price, V is the variable cost per unit, S is the sales volume, and F are fixed costs.

$$N = S \cdot (P - V) - F$$

Rearrange the formula to highlight the sales volume.

$S =$

- 3 Albert Einstein's famous formula for mass-energy equivalence gives an object's energy E , where m is the object's mass and c is a constant representing the speed of light:

$$E = mc^2$$

Rearrange the formula to highlight mass.

$m =$

4. The following formula gives the surface area S of a right cylinder, where r is the radius of the base and h is the height:

$$S = 2\pi r(r + h)$$

Rearrange the formula to highlight the height.

$h =$

Rearranging Linear Equations

Standard:
AR. 1.2

Write equations in problems 1,2,3 in slope-intercept form. Show Work. Box all answers.

Click [HERE](#) to watch a helpful video.

1. $-4y - 3x = 24$

3. $-4 = -6x - 2y$

2. $4x = 8y - 16$

4. Write the equation in standard form.

$$y = -5x + 8$$

Rewriting Roots as Rational Exponents

Follow directions for each problem. Box all answers.

Standards:

NSO. 1.2

NSO 1.3

Click [HERE](#) to watch a helpful video.

For problems 1 and 2 write an equivalent radical expression.

1. $t^{\frac{5}{8}}$

2. $x^{\frac{4}{7}}$

For problems 3 and 4 write an equivalent exponential expression.

3. $\sqrt[8]{z^7}$

4. $\sqrt[6]{k^5}$

Evaluating Functions From an Equation

Evaluate each function for the given value. Show work.

Place answer in box provided.

Standard:
F.1.2

Click [HERE](#) to watch a helpful video.

1. $f(t) = 2t - 3$

$$f(7) = \boxed{}$$

2. $h(x) = 17 + \frac{x}{6}$

$$h(-18) = \boxed{}$$

3. $h(t) = 50 - \frac{t}{5}$

$$h(35) = \boxed{}$$

4. $h(t) = -20 + 11t$

$$h(11) = \boxed{}$$

Solving Absolute Value Equations

Solve each equation. Show Work. Box all answers.

Click [HERE](#) to watch a helpful video.

Standards:

AR. 4.1

AR. 4.4

1. $|z - 13| = 21$

3. $|3x - 2| = -7$

2. $-3|r + 4| = -21$

4. $3|2x - 3| - 5 = 4$

Simplifying Square Roots

Standards:
NSO. 1.4

Simplify. Remove all perfect squares from inside the square root.
Show at least one step of work. Place answer in box provided.

Click [HERE](#) to watch a helpful video.

1. $\sqrt{18} =$

3. $\sqrt{180} =$

2. $\sqrt{98} =$

4. $\sqrt{45} =$

Solving Quadratics by Factoring (a = 1)

Solve each equation. Show the factors prior to the solutions. Box all answers.

Click [HERE](#) to watch a helpful video.

Standards:

AR. 3.1

AR. 3.2

1. $x^2 + 18x + 80 = 0$

3. $x^2 + 9x + 18 = 0$

2. $x^2 - 18x + 81 = 0$

4. $x^2 - 11x + 18 = 0$

Solving Quadratics by Grouping ($a \neq 1$)

Standards:

AR. 3.1

AR. 3.2

Solve each equation. Your work must include grouping. Box all answers.

Click [HERE](#) to watch a helpful video. Note: it is the same video as the previous page, but you will need to go further into the video to help with this concept.

1. $3x^2 + 10x - 8 = 0$

3. $12x^2 - 4x = 5$

2. $20x^2 + 7x - 6 = 0$

4. $12x^2 + 13x - 14 = 0$