

Franklin High School
Algebra 2

Below you will find a set of problems based on the Algebra 1 curriculum taught here at Franklin High School. The Standards below represent some, but not all of the skills you need to bring into your Honors class to be successful. It is expected that you:

1. Complete the problems below on another sheet of paper, with all work shown.
2. Be prepared for a test on the material below within the first week of class.
3. Go to the Franklin Community Library and access resources if you need assistance.

Standard 4 Distributive Property and Combining Like Terms

Simplify by combining like terms:

1. $9 - 8a + 5b + a + 7$
2. $5x - 8y - 9 + 4x - y + 12$

Use the distributive property to rewrite the following expressions.

Then combine like terms to simplify:

3. $6(7x + 11)$
4. $16 - 3(x - 5 + 8x)$
5. $4(2x + 9) + 3(7 - x)$

Standard 5a Solving Equations

Solve. Show all work.

1. $7x - 13 = 57$
2. $\frac{1}{3}x + 8 = 11$
3. $\frac{1}{6}(12x - 24) = 8$
4. $2x - 2 = 5x + 10$
5. $\frac{1}{2}x - \frac{3}{4} = 3x - \frac{1}{3}$

Standard 5b Solving Inequalities

Solve and Graph the following on a number line

- 1) $-\frac{2}{5}x \geq 6.$
- 2) $3x + 1 > -20.$
- 3) $\frac{1}{2}(4 - 10x) \leq -15.$
- 4) $2(x - 3) < 8$
- 5) $-14 < 4x + 2 \leq 10$

Standard 5c Solving Absolute Values

Solve

1. $|x| + 3 = 9$
2. $2|x + 2| - 8 = 12$
3. $|x| - 2 = -3$

Solve and Graph the following on a number line

4. $2|x + 4| - 7 < 1$
5. $4|2x + 3| - 2 \geq 10$

Standard 6 Graphing Linear Equations

1. Given the table below, find the equation:

x	1	2	3	9	12
y	1	4	7	25	34

2. Complete the table of values and graph the equation below.

x	$y = \frac{3}{2}x - 1$	y	(x,y)

3. Find the slope of the line that connects (-12, 5) and (-8, -3).

Graph using any method: 4. $y = -3x + 2$

5. $y = \frac{-2}{5}x - 4$

Standard 7 Deriving Linear Equations

1. Which of the points are on the line $5x - y = -8$?

A. (3, 2)

B. (-4, -3)

C. (-2, -2)

D. (8, 1)

2. Given the slope and point, write the equation of the line in $y = mx + b$ form.

(-5, 3) slope = -2

3. The x-intercept of a line is 3 and the y-intercept is 5. Write the equation of the line in $y = mx + b$ form.

Use the formula $y - y_1 = m(x - x_1)$ to write the equation of the line in $y = mx + b$ form, given the following:

4. (4, 3) and $m = 0$

5. (6, 16) and (-2, 12)

Standard 8 Parallel and Perpendicular Lines

1. What is the slope of the line parallel to: $-11x + 5y = 9$

2. What is the slope of the line perpendicular to: $-11x + 5y = 9$

3. Are the following lines parallel, perpendicular, or neither? Why?

$$6y = 8x + 12$$

$$4x - 3y = 6$$

4. Write the equation of the line through the point (3, -4) and parallel to $y = \frac{2}{3}x + 5$

5. Write the equation of the line through the point (3, 3) and perpendicular to $y = \frac{3}{4}x - 5$.

Standard 9 Solving Systems

1) Solve by GRAPHING

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

$$y = \frac{2}{3}x + 2$$

2) Is (4,5) a solution to the system

$$2x + 3y = 23$$

$$3x + 5y = 37$$

3) Solve the following system by SUBSTITUTION:

$$4x - 5y = 25$$

$$x = y + 7$$

4) Solve the following system by LINEAR COMBINATIONS:

$$3x - y = 9$$

$$2x + y = 6$$

5) Solve by any method of your choice:

$$5x - 2y = 0$$

$$2x - 3y = -11$$

Standard 10a Polynomial (Exponents)

Simplify completely. Write using positive exponents.

1. $(-2x^3)^4$

2. $5x^3y^7 \cdot 9x^2y^6$

3. $\frac{36x^9y^2z^4}{18x^3y^5z^4}$

4. $4(2x^4y^3)^2$

5. $\left(\frac{12x^7y^{-3}}{3x^5}\right)^2$

Standard 10b Polynomial (Basic Rules)

Simplify completely.

1. Give the degree for the polynomial: $3x^3y^2 - 7xy^5 + 2xy$

2. Identify the coefficients for the polynomial: $3x^3y^2 - 7xy^5 + 2xy$

3. Write the polynomial below in descending order: $3x^3 - 7x + 2x^2 - 9$

4. A polynomial with one terms is called a? With two terms? With three terms?

5. Simplify the polynomial below and write your results in descending order.

$$5 - 5x + 3x^2 - x + 2 + x^2$$

Standard 10b Polynomial (Basic Operations)

Add/Subtract the following polynomials:

1. $(3x^2 - x + 2) + (-6x^2 + 4x + 6)$

2. $(3x^2 - x + 2) - (-6x^2 + 4x + 6)$

Multiply and simplify the polynomials below:

3. $(3x + 2)(4x - 1)$

4. $(3x + 2)^2$

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

Standard 11 Factoring Polynomials

1. Factor out the GCF: $9x^3 - 21x^2 + 15x$

2. Factor by grouping: $8x^3 + 2x^2 + 12x + 3$

Factor the following completely:

3. $25x^2 - 16$

4. $4x^2 - 4x + 1$

5. $6x^2 + 11x + 4$

Standard 14 Solving Quadratics

Solve each of the following by factoring completely.

1. $x^2 + 20x + 100 = 0$

2. $x^2 - 5x = 14$

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

4. $2x^2 - 16x + 30 = 0$

5. $6x^2 - 21x = 12$

Standard 12 Simplifying Rational Expressions

Simplify the following completely.

1. $\frac{6a + 18}{3a + 9}$

2. $\frac{3x^2 + 21x + 30}{3x + 6}$

3. $\frac{x^2 - 4x + 4}{x - 2}$

4. $\frac{x^2 - 16}{x^2 - 8x + 16}$

5. $\frac{8x^2 + 28x + 48}{2x^2 + 10x + 12}$

Standard 13 Adding, Subtracting, Dividing Rational Expressions

Simplify the following completely.

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

2) $\frac{3x + 11}{x + 7} - \frac{2x - 4}{x + 7}$

3) $\frac{3x^3}{6x} \cdot \frac{2x^2y}{y} \div \frac{-6x}{2y^2}$

4) $\frac{n^2}{n + 6} - \frac{3n}{n - 3}$

5) $\frac{x^2}{x^2 - 16} \div \frac{2x^3 - 32x}{x^2 + 2x - 8}$

Additional Topics:

1. Sarah can eat a box of popcorn in 10 minutes. Janet can eat a box of popcorn in 15 minutes. They go to the movies and share a box of popcorn. How long will it take them to finish it?

2. Mrs. Lee can paint a house in 8 hrs. Ms. Lim can paint the same house in 10 hours. How long would it take the two of them working together to paint the house?

3. A bicyclist travels 20 miles per hour faster than a walker. The cyclist traveled 25 miles in the time it took the walker to walk 5 miles. Find their speeds.

4. A car leaves Elk Grove to L.A. at 55 miles per hour. An hour later a second car leaves Elk Grove to L.A. traveling at 75 mph. How long will it be before the second car catches the first car?

5. Mr. Reed has a 40% solution of plant food and a 10% solution of plant food. He wants to make 10 liters of a 20% food plant mixture. How many liters of each kind does he need?

6. A solution containing 20% fungicide is to be mixed with a solution containing 45% fungicide to make 250 L of a solution containing 30% fungicide. How much of each solution should be used?

	Amount of Fungicide	Percentage of Fungicide	Amount of Fungicide
Solution A			
Solution B			
Mixture			

7. Benjamin was in charge of buying milk for a class picnic for 32 students. Milk is sold in half-gallon cartons and gallon cartons at a neighborhood grocery store. The half-gallon carton cost \$ 1.46 and the gallon carton cost \$ 2.39. When he got to the store, there was not much milk left. Benjamin bought all 21 cartons they had and paid a total of \$ 41.82. How many cartons of each cartons of each size did he buy?

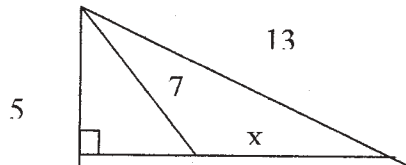
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5. Find x



6. A vending machine takes only nickels and dimes. There are 5 times as many dimes as nickels in the machine. The face value of the coins is \$ 4.40. How many of each coin are in the machine?
7. Tickets to a Franklin High School play cost \$ 5.00 for each adult and \$ 3.75 for each child. If 530 tickets were sold for a total of \$ 2412.50, how many tickets of each kind were sold?
8. A diagonal of a square has a length of $8\sqrt{2}$ ft. Find the length of a side of the square.
9. One leg of a right triangle is 5 times the other leg. Find the longer leg if the hypotenuse is 60 ft.

Algebra 2--Summer Work Answers



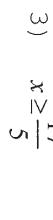


Standard 4

- 1) $-7a + 5b + 16$
- 2) $9x - 9y + 3$
- 3) $42x + 66$
- 4) $-27x + 31$
- 5) $5x + 57$


Standard 5a

- 1) $x = 10$
- 2) $x = 9$
- 3) $x = 6$
- 4) $x = -4$
- 5) $x = -\frac{1}{6}$

Standard 5b

- 1) $x \leq -15$

- 2) $x > -7$

- 3) $x \geq \frac{17}{5}$

- 4) $x < 7$

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


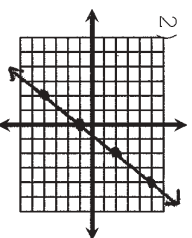
Standard 5c

- 1) $x = 6, -6$
- 2) $x = 8, -12$
- 3) No Solutions
- 4) $-8 < x < 0$


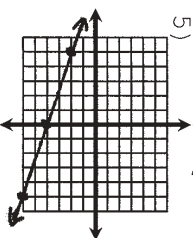
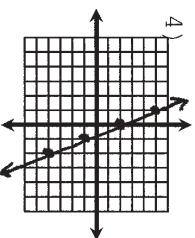
- 5) $x \leq -3$ or $x \geq 0$


Standard 6

- 1) $y = 3x - 2$



- 3) $m = -2$



Standard 7

- 1) $(-2, -2)$
- 2) $y = -2x - 7$
- 3) $y = -\frac{5}{3}x + 5$
- 4) $y = 3$
- 5) $y = \frac{1}{2}x + 13$

Standard 8

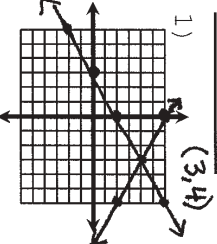
- 1) $m \parallel = \frac{11}{5}$
- 2) $m \perp = -\frac{5}{11}$

3) lines are \parallel because slopes are the same.

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

- 5) $y = -\frac{4}{3}x + 7$

Standard 9



Standard 9

- 2) $(4, 5)$ is a solution.
- 3) $(10, 3)$
- 4) $(3, 0)$
- 5) $(2, 5)$

Standard 10a

- 1) $16x^{12}$
- 2) $45x^5y^{13}$
- 3) $\frac{2x^6}{y^3}$
- 4) $16x^8y^6$
- 5) $\frac{16x^4}{y^6}$

Standard 10b

- 1) Degree is 6
- 2) Coefficients: 3, -7, 2
- 3) $3x^3 + 3x^2 - 7x - 9$
- 4) 1 term= monomial
2 terms= binomial
3 terms= trinomial
- 5) $4x^2 - 6x + 7$

Standard 10b

- 1) $-3x^2 + 3x + 8$
- 2) $9x^2 - 5x - 4$
- 3) $12x^2 + 5x - 2$
- 4) $9x^2 + 12x + 4$
- 5) $18x^3 - 21x^2 + 17x - 10$

Standard 11

- 1) GCF = $3x$
- 2) $(4x+1)(2x^2+3)$
- 3) $(5x-4)(5x+4)$
- 4) $(2x-1)(2x-1)$
- 5) $(3x+4)(2x+1)$

Standard 14

- 1) $x = -10$
- 2) $x = 7, -2$
- 3) $x = -\frac{2}{3}, \frac{7}{2}$
- 4) $x = 3, 5$
- 5) $x = -\frac{1}{2}, 4$

Standard 12

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

$$5) \frac{2(2x^2 + 7x + 12)}{x^2 + 5x + 6}$$

Standard 13

- 1) $\frac{8x-6}{x+7}$
- 2) $\frac{x+15}{x+7}$
- 3) $\frac{-x^3y^2}{3}$
- 4) $\frac{n(n^2-6n-18)}{(n+6)(n-3)}$
- 5) $\frac{x(x-2)}{2(x-4)^2(x+4)}$

Additional Topics

- 1) $t = 6$ minutes
- 2) Biker 25 mph
Walker 5 mph
- 3) 150 L of 20%
solution; 100 L of
45% solution
- 4) Nine $\frac{1}{2}$ gallon
cartons, twelve 1
gallon cartons
- 5) $x = 12 - 2\sqrt{6}$
- 6) 8 nickels, 40
dimes
- 7) 340 adults, 190
children
- 8) 8 cm
- 9) The longer leg is
58.834 feet