

Honors Geometry Summer Assignment 2020

***All work must be NEATLY done on a separate sheet of paper!**

Algebra Review: Linear Equations

Solve each equation:

1) $2p + 5 = 13$

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

2) $12 + 2b = 2 + 5b$

6) $6x - 3(6 - 5x) + 3x = 10 - 4(2 - x)$

3) $4x + 5 + 5x + 40 = 180$

7) $\frac{1}{2}(6 + 4x) - \frac{1}{4}(8x - 12) = \frac{1}{2}(2x - 4)$

4) $2(4x + 4) = x + 1$

8) $5x - [7 - (2x - 1)] = 3(x - 5) + 4(x + 3)$

Algebra Review: Proportions

Definition: $\frac{a}{b} = \frac{c}{d}$ if and only if $ad = bc$

Solve the following proportions using the format in the examples:

1) $\frac{7}{2} = \frac{y}{3}$

2) $\frac{25}{15} = \frac{10}{x}$

3) $\frac{10}{6x+7} = \frac{6}{2x+9}$

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

5) $\frac{3x-5}{2} = \frac{x-15}{4}$

6) $\frac{2-4x}{-6} = \frac{6x-8}{10}$

Algebra Review: Systems of Equations

Solve each system of equations by the SUBSTITUTION method. Answers should be coordinates.

1) $y = 2x + 5$

2) $8x + 3y = 26$

3) $x - 7y = 13$

$3x - y = 4$

$2x = y - 4$

$3x - 5y = 23$

Solve each system of equations by the ELIMINATION method. Answers should be coordinates.

1) $3x + 4y = 9$
 $-3x - 2y = -3$

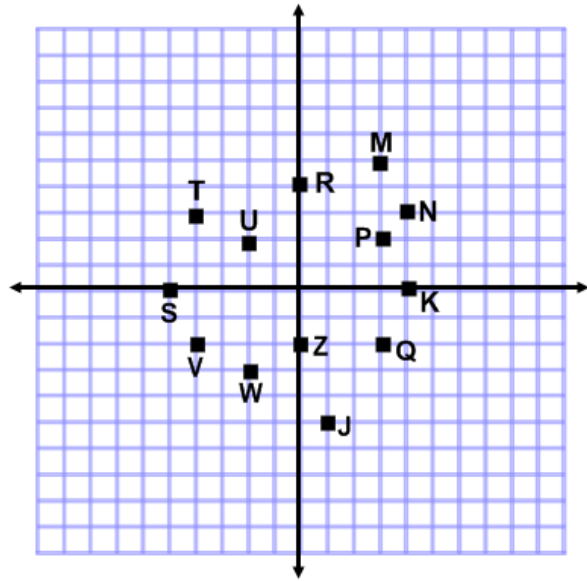
2) $4x - 6y = -26$
 $-2x + 3y = 13$

3) $2x - 8y = 24$
 $3x + 5y = 2$

Algebra Review: The Coordinate Plane

Name the coordinates of each point:

- | | |
|------|-------|
| 1) M | 6) T |
| 2) N | 7) U |
| 3) K | 8) V |
| 4) R | 9) W |
| 5) S | 10) Q |

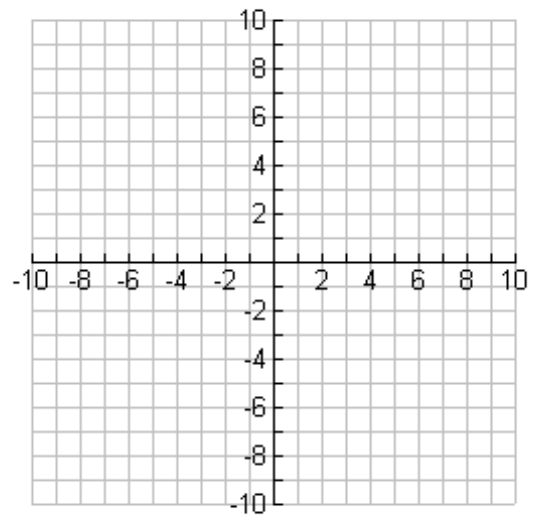


- 11) Name all the points shown that lie on the x-axis.
- 12) Name all the points shown on the y-axis.
- 13) What is the x-coordinate of every point that lies on the vertical line through P?
- 14) Which of the following points lie on a horizontal line through W?

- | | | | | | |
|--------|-------|--------|--------|--------|-------|
| (-2,1) | (2,3) | (1,-3) | (-2,0) | (0,-3) | (2,0) |
|--------|-------|--------|--------|--------|-------|

Plot and label each point on the graph.

- | | |
|---------------|---------------|
| 19) A (2,1) | 23) B (5,0) |
| 20) C (0,3) | 24) D (-3,1) |
| 21) E (-2,-1) | 25) F (1,-2) |
| 22) G (4,-2) | 26) H (-4,-3) |



Algebra Review: Fractions

Simplify the following expressions.

- | | | | |
|--------------------|------------------------|-----------------------|---------------------------|
| 1) $\frac{14}{70}$ | 2) $\frac{75}{15}$ | 3) $\frac{18a}{36}$ | 4) $\frac{3x}{x}$ |
| 5) $\frac{x}{3x}$ | 6) $\frac{5bc}{10b^2}$ | 7) $\frac{-8y^3}{2y}$ | 8) $\frac{-18r^3t}{12rt}$ |

9) $\frac{6a+12}{6}$

10) $\frac{33ab-22b}{11b}$

11) $\frac{x+2}{3x+6}$

12) $\frac{2c-2d}{2c+2d}$

Algebra Review: Radical Expressions

Simplify the following:

1) $\sqrt{36}$

2) $\sqrt{24}$

3) $\sqrt{98}$

4) $\sqrt{300}$

5) $\sqrt{\frac{1}{4}}$

6) $\frac{\sqrt{5}}{\sqrt{3}}$

7) $\sqrt{\frac{80}{25}}$

8) $\frac{2\sqrt{3}}{\sqrt{12}}$

9) $\sqrt{13^2}$

10) $(\sqrt{17})^2$

11) $(2\sqrt{3})^2$

12) $(3\sqrt{8})^2$

13) $5\sqrt{18}$

14) $4\sqrt{27}$

15) $6\sqrt{24}$

16) $9\sqrt{40}$

Algebra Review: FactoringExample: (quadratic) $x^2 + 7x + 12 = (x + 3)(x + 4)$

Factor each expression completely:

1. $x^2 + 3x$

2. $2x^2 - 10x$

3. $x^2 + 3x + 2$

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

5. $x^2 - 6x - 27$

6. $x^2 + 5x - 36$

7. $x^2 - 25$

8. $9x^2 - 49$

9. $3x^2 - 5x - 2$

10. $2x^2 + x - 10$

11. $x^3 - 4x^2 - 21x$

Algebra Review: Quadratic Equations

Example: $3x^2 + 14x + 8 = 0$

$$(3x + 2)(x + 4) = 0$$

$$3x + 2 = 0 \text{ or } x + 4 = 0$$

$$x = -2/3 \text{ or } x = -4$$

Solve by factoring:

1) $x^2 + 5x - 6 = 0$

5) $4x^2 + 15 = 17x$

2) $x^2 - 7x - 18 = 0$

6) $3x^2 - 13x - 10 = 0$

3) $x^2 = 20x - 36$

7) $6x^2 + 11x - 10 = 0$

4) $x^2 + 8x = 20$

8) $8x^2 + 10x - 25 = 0$

Algebra Review: Quadratic Equations (Quadratic Formula)

Quadratic formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Solve each equation by the quadratic formula.

1. $x^2 + 6x + 9 = 0$

2. $x^2 - 4x - 12 = 0$

3. $x^2 + 6x - 4 = 0$

4. $2x^2 + 6x + 3 = 0$

5. $5x^2 - x - 4 = 0$

Algebra Review: Writing equations of lines

Slope is the ratio of the change in the y-coordinates over the change in the x-coordinates

$$m = \frac{y_2 - y_1}{x_2 - x_1} \text{ where } (x_1, y_1) \text{ and } (x_2, y_2) \text{ are points on the line.}$$

Practice: Find the slope of the line that passes through each pair of points.

1. (2, 3) and (-4, 8)
2. (1/4, 1/2) and (3/4, 3/8)

The slope-intercept form of a line is $y = mx + b$ where m is the slope and b is the y-intercept.

State the slope and y-intercept of the following lines

3. $y = 4x - 6$
4. $y = \frac{1}{2}x + 8$

Write an equation of a line using slope-intercept form or point-slope equation.

Using slope-intercept form

1. Find the y-intercept or "b". Substitute the slope (m) and the point (x, y) into $y = mx + b$ and solve for "b".
2. Substitute the slope "m" and "b" into $y = mx + b$

Using Point-Slope equation for a line

$(y - y_1) = m(x - x_1)$ where m is the slope and (x_1, y_1) is a point on the line

****Make sure you simplify to $y = mx + b$ ****

Write the equation of a line in slope-intercept form for the lines with the following slopes and y-intercepts.

5. $m = 2/3$ through (3, -4)
6. $m = -4$ through (1, -3)

How do you write an equation of a line given two points?

1. Find the slope using the formula $m = \frac{y_2 - y_1}{x_2 - x_1}$
2. Now write the equation of the line using point-slope equation or slope-intercept form.

Write the equation for the following lines through:

7. (3, -6) and (6, 2)
8. (-7, 2) and (-3, 5)