

**Prerequisite skills for Algebra II**

*Topic list items link to videos with lessons:*

- solving linear [equations/inequalities](#) and absolute value [equations/inequalities](#)
- [functions vs. relations](#)
- [graphing functions from tables of values](#)
- [finding x and y intercepts from standard form](#)
- [writing equations in point-slope, slope intercept, standard form](#)
- [solving systems of equations](#) (2 variables)
- [systems of linear inequalities](#)
- quadratic [factoring](#) and including  $a \neq 1$
- [simplifying square roots](#)

**Topic 1: Simplifying/Evaluating Expressions**

1.  $14y + 22 - 15y^2 + 23y - 6$

2.  $3(18z - 4w) - 2(10z + 6w)$

3.  $5c^3 - 6c^2; c = -5$

4.  $\frac{30-6}{2 \cdot 4^2 - 20}$

**Topic 2: Solving Linear & Absolute Value Equations**

1.  $\frac{3}{4}x + 7 = 16$

2.  $140 = 4x + 30$

3.  $8(3x - 4) = 196$

4.  $198 = 154 + 7x - 68$

5.  $-131 = -5(3x - 8) + 6x$

6.  $-(12x - 6) = 12x + 6$

7.  $\frac{2}{3}a - 4 = \frac{1}{4}a - \frac{1}{2}$

8.  $3 + \frac{4}{5}x = \frac{2}{15}x - \frac{3}{10}$

9.  $|x - 3| = 10$

10.  $-2|2x + 3| = 16$

11. Solve for  $m$  in  $y = mx + b$

12. Solve for  $w$  in  $P = 2l + 2w$

**Topic 3: Solving Inequalities** (graph your solution on a numberline)

1.  $-3x + 2 > 8$

■

2.  $-4x + 3 \leq -6x + 12$

■

3.  $5x + 25 < 0$  or  $6x - 36 > 0$

4.  $2x - 10 < -2$  and  $x + 3 > -15$

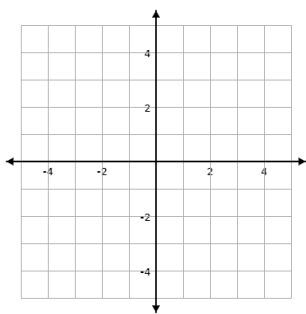
■

**Topic 4: Linear Functions**

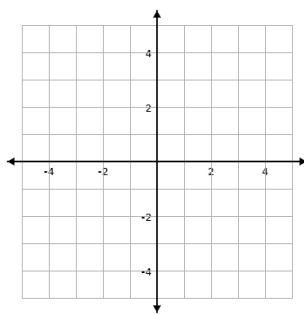
1. Slope formula:  $m = \underline{\hspace{2cm}}$

2. On the graphs below, draw a line with the indicated slope.

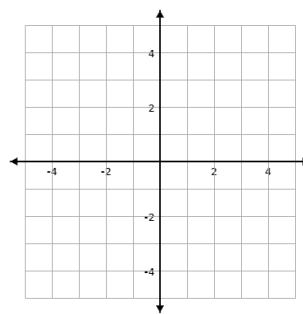
Positive Slope



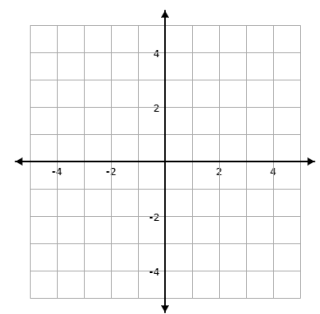
Negative Slope



Zero Slope



Undefined Slope



3. Find the slope of the line containing each pair of points.

a.  $(-1, 4)$  and  $(1, -2)$

b.  $(2, -1)$  and  $(-2, 3)$

c.  $(2, -4)$  and  $(6, -4)$

d.  $(8, 5)$  and  $(8, 1)$

4. An equation of a line can be written in the forms listed below. Define the variables.

a. Slope - Intercept Form:  $y = mx + b$

$m =$  \_\_\_\_\_  $b =$  \_\_\_\_\_

b. Point - Slope Form:  $y - y_1 = m(x - x_1)$

$m =$  \_\_\_\_\_  $x_1 =$  \_\_\_\_\_  $y_1 =$  \_\_\_\_\_

c. State the Standard Form of a line: \_\_\_\_\_

5. A horizontal line has the equation of the form \_\_\_\_\_.

6. A vertical line has the equation of the form \_\_\_\_\_.

7. Write the equation of the line with the given information. You may use any form of a line.

a. Slope = -2 and Point (0, 5)

b. Slope =  $-\frac{3}{4}$  and Point (12, -2)

c. Points (1, 4) and (-3, 0)

d. Undefined Slope and Point (-6, -3)

8. Given the points G(-4, 5) and H(-2, -1).

a. Write the equation of the line GH.

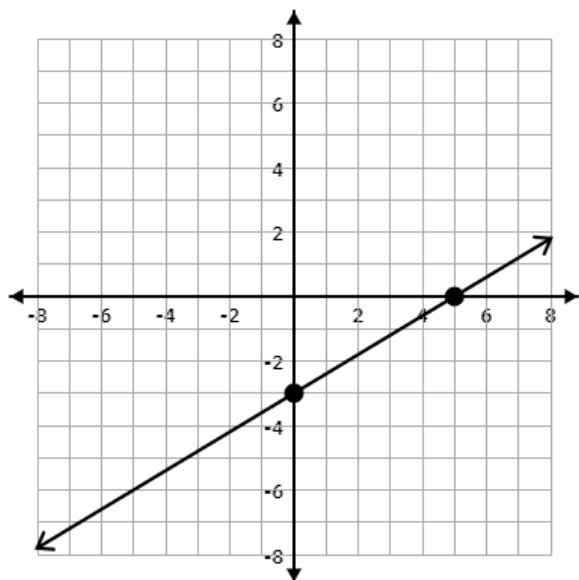
b. Write an equation of a line parallel to the line in part (a).

c. Write an equation of a line perpendicular to the line in part (a).

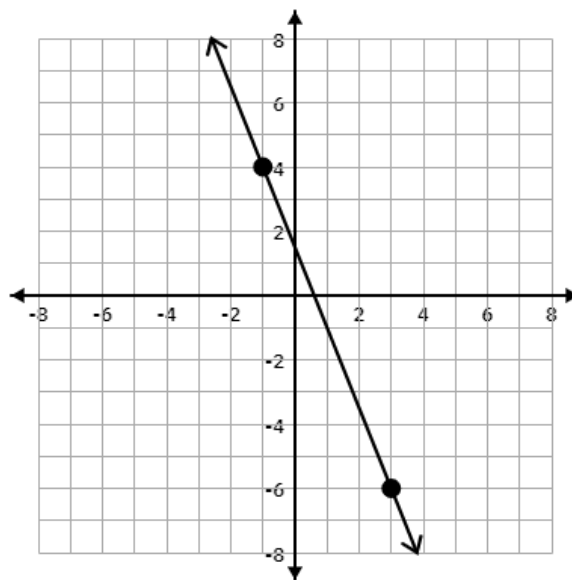
d. What type of angle do the lines in parts b and c create at their intersection?

9. Write the equation for each of the lines graphed below.

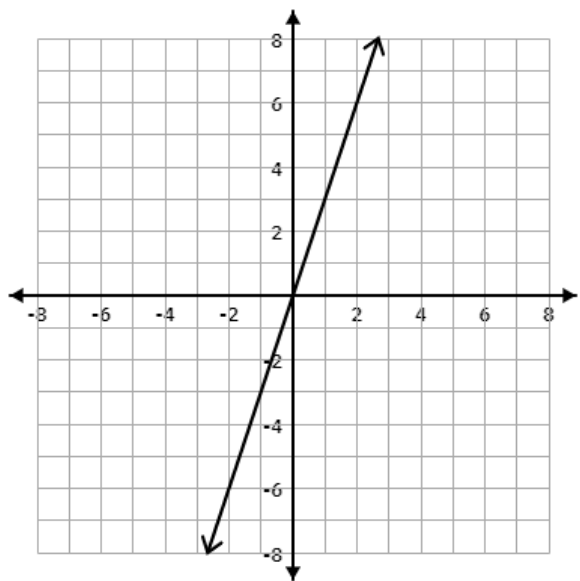
a.



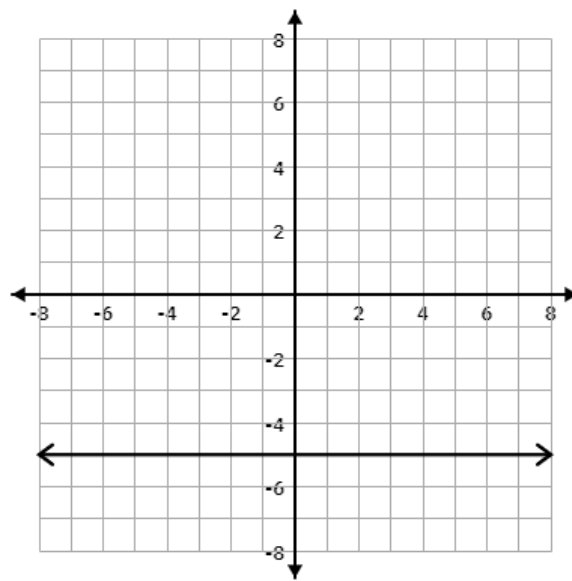
b.



c.

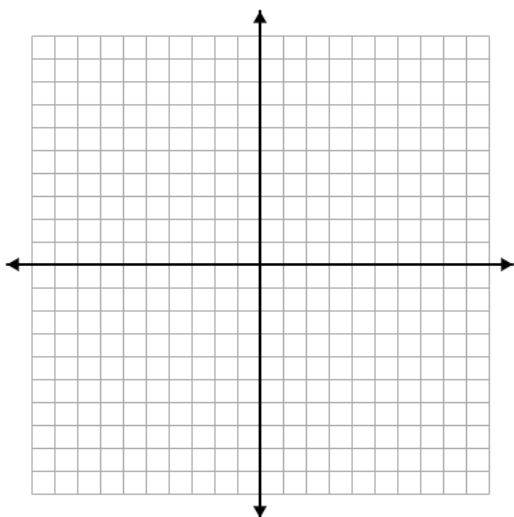


d.

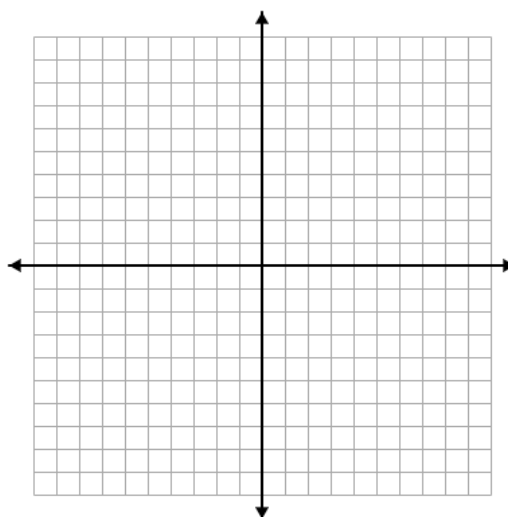


## 10. Graphing Linear Functions

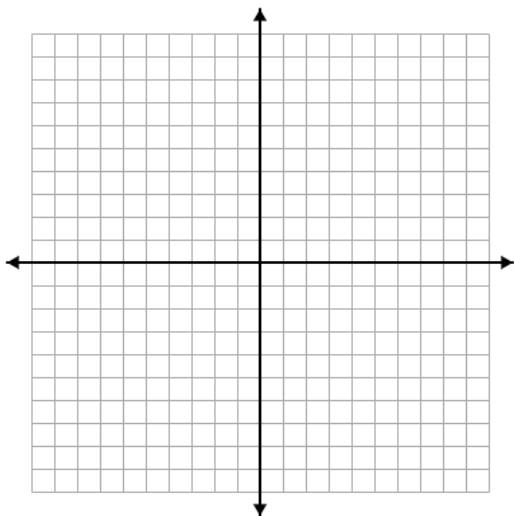
a.  $y = 3x - 1$



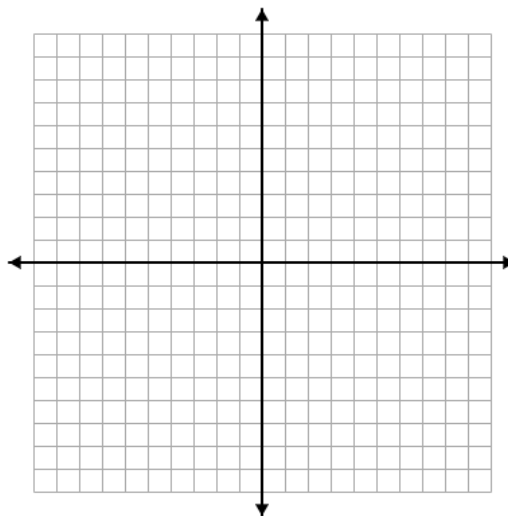
b.  $x = 2$



c.  $3x + 4y = 24$



d.  $y - 2 = \frac{1}{2}(x + 6)$



**Topic 5: Systems of Equations**

1. Solve each system of equations. Make sure to provide a value for x and y.

a.  $y = \frac{2}{3}x - 2$   
 $y = \frac{-1}{3}x + 1$

b.  $y = -2x + 9$   
 $3x - 4y = 8$

c.  $-2x + 7y = 10$   
 $x - 3y = -3$

2. At a recent concert, there were 1500 people. Adult tickets were \$12 each and student tickets were 50% off the adult price. If the concert profit was \$15,600, find the number of adult and student tickets sold.

**Topic 6: Factoring quadratic expressions**

*Factor the following completely or state that it is prime:*

1.  $9x^2 - 36$

2.  $8x^2 + 25x + 3$

3.  $6x^2 - 30x - 36$

4.  $x^2 - 10x + 25$

5.  $3x^2 + x - 10$

6.  $3x^2 + 17x + 10$

7.  $4y^2 + 14y + 6$

8.  $6x^2 - 12x - 18$

**Topic 7: Simplifying square roots.***Simplify each:*

a.)  $\sqrt{98}$

b.)  $\sqrt{72}$

c.)  $\sqrt{108}$

d.)  $2\sqrt{6} \cdot 5\sqrt{3}$

e.)  $\sqrt{15} \cdot \sqrt{10}$

f.)  $\frac{\sqrt{50}}{\sqrt{2}} - \sqrt{20}$

g.)  $\sqrt{20} - \sqrt{200} + \sqrt{45}$

h.)  $\sqrt{\frac{32}{50}}$

i.)  $\frac{\sqrt{120}}{\sqrt{20}}$

**HONORS ALGEBRA 2 ONLY SECTIONS****Solving quadratics.** *Solve for  $x$  using any appropriate method*

a.)  $x^2 - 3x = 4$

b.)  $x^2 = 10x - 25$

e.)  $x^2 - 6x + 8 = 0$

f.)  $3x^2 - 7x + 2 = 0$

g.)  $x^2 - 3x + 1 = 6$

h.)  $4x^2 + 7x + 2 = 0$

**Rational Expressions.** *Multiply, divide, simplify. State any restrictions.*

a)  $\frac{3x-12}{8x+12} \cdot \frac{12x+8}{5x-20}$

b)  $\frac{3x^2}{5y^3} \div \frac{9x^8}{15y^6}$

c)  $\frac{x^2+4x}{x-5} \div \frac{x^2-x-20}{2}$

d)  $\frac{x^2-6x+5}{x^2-x-20} \cdot \frac{x^2-16}{1-x^2}$

e)  $\frac{x^2+4x+4}{x^2-4}$

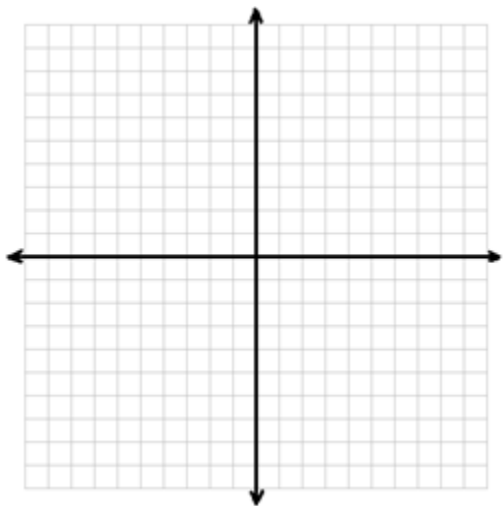
f)  $\frac{x^2+5x-6}{x^2-4x+4}$



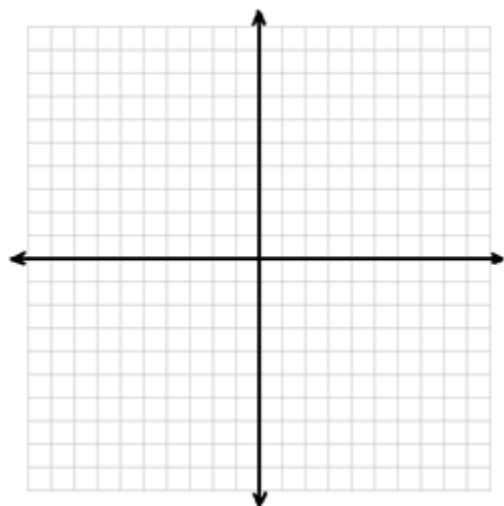
**Graphing from tables of values**

*Create a table for each and graph the function*

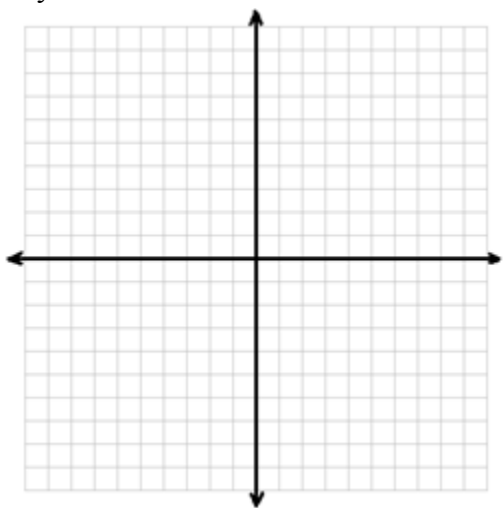
a)  $y = 3x - 1$



b)  $y = -|x| + 3$



c)  $y = x^3$



d)  $y = 3 - \sqrt{x}$

