

Major Topics

- Functions & Relations
- Linear Equations
- Families of Functions
- Absolute Value Functions
- Two-variable Inequalities

Formulas

$$y = mx + b$$
$$y - y_1 = m(x - x_1)$$
$$Ax + By = C$$
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Vocabulary

- Relation
- Function
- Domain
- Range
- VLT (vertical line test)
- Direct Variation
- Slope
- x and y intercept
- Piecewise Function
- Scatter Plot
- Line of Best Fit
- Parent Function
- Transformation
- Translation
- Reflection
- Stretch / Compression
- Axis of Symmetry

You should be able to:

- Use function notation
- Evaluate functions
- Use direct variation
- Find the slope of a line
- Write and graph linear equations
- Understand perpendicular & parallel lines with slope
- Find the line of best fit
- Graph families of functions using transformations
- Graph absolute value functions

Classwork:

1) Evaluate each function for the given value(s).

a) $f(x) = 3x - 5$ when $x = -2$.

b) If $g(x) = -3x^2 - 5x$ find $g(4)$ and $g(-2)$.

2) If x and y vary directly and $x = 8$ when $y = 44$; find the equation that relates the variables.

3) Given the two points, find the equation of the line in slope intercept form, point slope form, standard form and then graph the line. What are the x and y intercepts and the slope?

a) $(3, 6)(2, 9)$

b) $(-3, 8)(-7, 9)$

c) $(-3, 6)(5, 6)$

d) $(2, 12)(2, -1)$

4) Write the equation (in all 3 forms) of a line that is perpendicular to $y = \frac{3}{4}x + 1$ and goes through the point $(3, -6)$.

5) Make a scatter plot and find the line of best fit given: $(-10, 3), (-5, 1), (-1, -4), (3, -7), (12, -12)$.

6) Graph each absolute value function using transformations. Label the vertex.

a) $f(x) = |x - 2| + 3$

b) $h(x) = 2|x + 1|$

c) $g(x) = \frac{1}{3}|x| - 4$

d) $f(x) = -|x + 3| + 5$

Evaluate the function for the given value(s).

1) $f(x) = -x^2 + 5x - 8$ when $x = -5$ and when $x = 3$.

2) If t and r vary directly and $t = 9$ when $r = \frac{2}{3}$; find the equation that relates the variables.

Given the two points, find the equation of the line in slope intercept form, point slope form, standard form and then graph the line. What are the x and y intercepts and the slope?

3) $(6, -7)(3, 1)$

4) $(-2, 9)(-2, -4)$

5) Write the equation (in all 3 forms) of a line that is perpendicular to $y = -3x + 5$ and goes through the point $(-4, 9)$.

6) Make a scatter plot and find the line of best fit given: $(-15, 8), (-8, 7), (-3, 0), (0, 0), (7, -3)$.

Graph each absolute value function using transformations. Label the vertex.

7) $f(x) = |x + 3| - 2$

8) $h(x) = \frac{1}{2}|x - 3|$

9) $g(x) = -4|x| + 5$

10) $f(x) = -|x - 4| - 1$