

1.2 Review of Functions and Graphing

This section does a quick review of functions and graphing.

Slope Formula

The slope formula is used to find the slope between two points (x_1, y_1) and (x_2, y_2) :

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

EXAMPLE: Find the slope of a line passing through $(-1, 3)$ and $(2, 4)$.

Slope-Intercept Formula– this is the standard form of a line which allows you to easily identify the slope and y-intercept.

$y = mx + b$ Here the slope is m and the y-intercept is $(0, b)$.

Point-Slope Formula – this is used when you want to find the equation of a line when you are given a slope and another point on the line. This other point does not need to be the y-intercept.

$$y - y_1 = m(x - x_1)$$

EXAMPLE: Use the information and given conditions to write an equation for each line in slope-intercept form as well as the point-slope form.

Slope = $-\frac{3}{5}$, passing through $(10, -4)$.

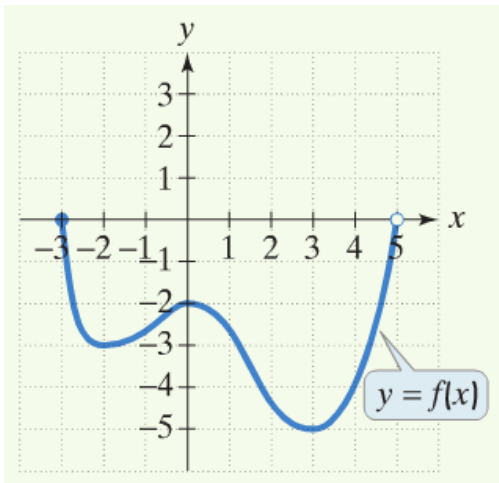
Finding x and y intercepts from an equation

To find the x-intercept, put in a zero for y and solve for x.

To find the y-intercept, put in a zero for x and solve for y.

EXAMPLE: Find the intercepts given $4x + y^2 = 4$.

EXAMPLE: Use the graph below to answer the following questions



a.) Indicate the interval(s) of which f is increasing

b.) Indicate the interval(s) of which f is decreasing

c.) List the number(s) where f has a relative minimum.

d.) What is the relative maximum(s)?

e.) What is the relative minimum(s)?

f.) What is the domain?

g.) What is the range?

Function Definition: For each input (x) there can only be one output (y).

Function notation: $f(x)$ which means “f of x”. This does not mean f times x. It means that we have a function called f which contains the variable x.

EXAMPLE: Given the function $f(x) = 2x - 5$, find the following:

a.) Find $f(3)$. Solve $f(x) = 7$.

b.) $f(x + 3)$

c.) $f(x + h)$

d.) $f(-x)$

e.) $-f(x)$

Domain: (input) all the x-values that make the equation defined

Defined: There is no division by zero or square roots of negative numbers

Range: (output) all y-values that a graph uses.

EXAMPLE: Find the domain: $y = 2x - 5$

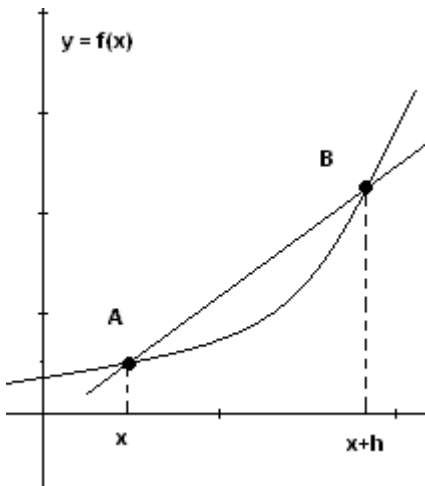
EXAMPLE: Find the domain: $y = \frac{x+1}{2x-5}$

EXAMPLE: Find the domain: $y = \sqrt{2x-5}$

EXAMPLE: Find the domain: $y = \frac{3}{\sqrt{2x-5}}$

EXAMPLE: Find the domain: $y = \frac{1}{x^2 + 9}$

Difference Quotient



EXAMPLE: Let $f(x) = 2x - 3$. Find the difference quotient.

EXAMPLE: Let $f(x) = 3x^2 - x + 1$. Find the difference quotient.