Learning Center

Schoolcraft College

Jump Start

Session 6

Functions

Functions have inputs (_____) and outputs (_____).

Functions also have a degree, which is _____

Ex: Given the function $f(x) = 2x^2 - 5x + 4$, evaluate the following:

$f(2) =$

$f(-3) =$

$f(3x) =$

$f(x-1) =$

$f(x) + 2 =$

$f(a+b) =$

$\frac{f(x+h)-f(x)}{h} =$

Domain

The domain of a function is _____. Some functions can use any number as an input, while others have restrictions on the inputs.

Polynomials – Any polynomial function can take any number as its input, so its domain is written as

Domain restrictions – what can't we do with numbers?

Rational functions (denominators)

Roots (even roots)

Logarithms

Find the domain of the function $f(x) = \frac{x+1}{x^2-x-12}$

Find the domain of the function $f(x) = \frac{\sqrt{x-2}}{x^2-6x+5}$

Find the domain of the function $f(x) = \frac{2+\sqrt{x+1}}{\sqrt{5-x}}$

Find the domain of the function $f(x) = \log_2(x+5) + \log_2(x-1)$

Graphing Polynomial Functions

There are certain expectations for graphing polynomial functions. There are also certain shortcuts we can take to make the process faster.

What they want to see:

Intercepts – x-intercepts (roots) and the y-intercept

End behavior

Even functions

Odd functions

Shortcuts – multiplicity and sign charts

Graph the function $f(x) = (x-1)^2(x+3)$

Graph the function $f(x) = -(x+4)^2(x-2)^2$

Graph the function $f(x) = -x(x-3)^3(x-5)$

Graphing Rational Functions

There are certain expectations for graphing rational functions. There are also certain shortcuts we can take to make the process faster.

What they want to see:

Intercepts – x-intercepts (roots) and the y-intercept

Vertical asymptotes

End behavior – horizontal asymptotes

Shortcuts – multiplicity and sign charts

Graph the function $f(x) = \frac{18}{(x-3)^2}$

Graph the function $f(x) = \frac{5x^2+25x}{x^2-4}$

Graph the function $f(x) = \frac{(x+3)^2(x-4)}{x(x-2)}$