LIVEMATH JumpStart — Lesson 3 : Functions

## Just Looking

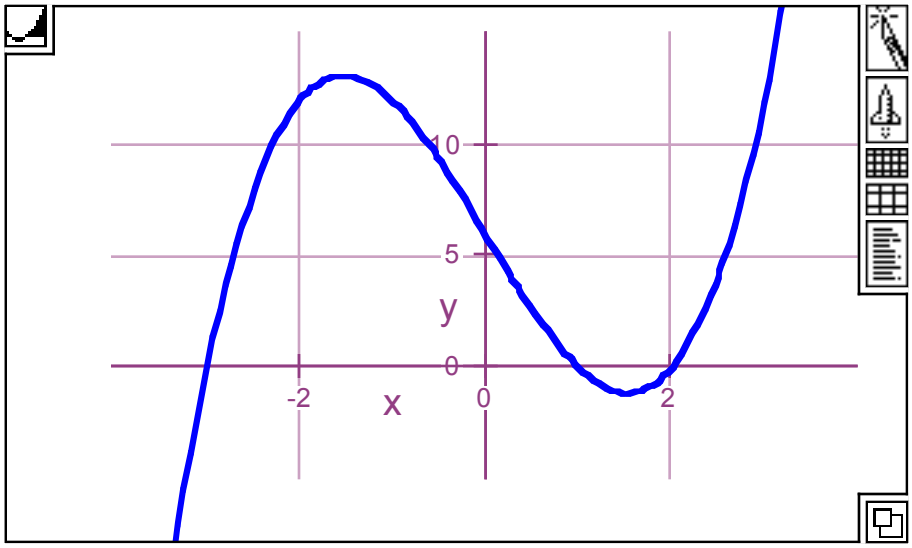
**Take a look at a LiveMath notebook.**
**Don't do anything.....Just look.**

This lesson will cover the basics on creating and using functions.

A Function named f behaves as defined by user.

$f(x) = (x + 3)(x - 1)(x - 2)$

$y = f(x)$




$f(0)$

$f(0) = 6$ Calculate

A Function named f' behaves as defined by user.

$f'(x) = \frac{\partial}{\partial x} f(x)$

$f'(x) = (x + 3)(x - 2) + (x + 3)(x - 1) + (x - 2)(x - 1)$ Substitute

$f'(x) = 3x^2 - 7$ Expand

$f'(x) = 3x^2 - 7$ Substitute

$x = x$

$f'(1)$

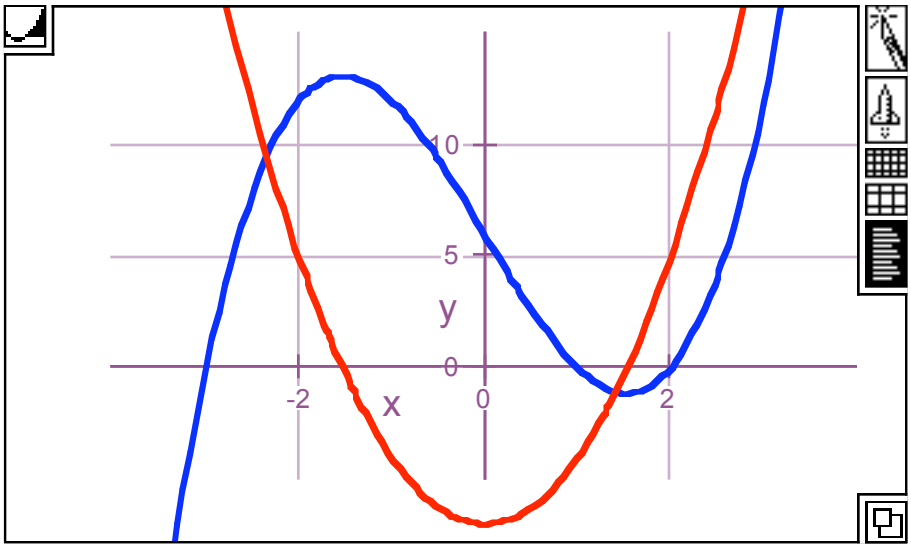
$f'(1) = -4$ Calculate

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

$\frac{f(x + h) - f(x)}{h} = \frac{(h + x + 3)(h + x - 2)(h + x - 1) - (x + 3)(x - 2)(x - 1)}{h}$ Substitute

$\frac{f(x + h) - f(x)}{h} = h^2 + 3x^2 + 3hx - 7$ Expand

$y_1 = f'(x)$




□ 4 ... 4 = left...right Stretch to Fit

□ 5 ... 15 = bottom...top cropping Moderately

Graph Building Blocks

Curve at $(x, y)$ where $x$ = left ... right with a heavy line, colored Blue.

Curve at $(x, y_1)$ where $x$ = left ... right with a heavy line, colored Red.

□ $f'(x) = 0$

△ $3x^2 - 7 = 0$ Substitute

○ △ $x = \frac{1}{3}\sqrt{21}$ Isolate

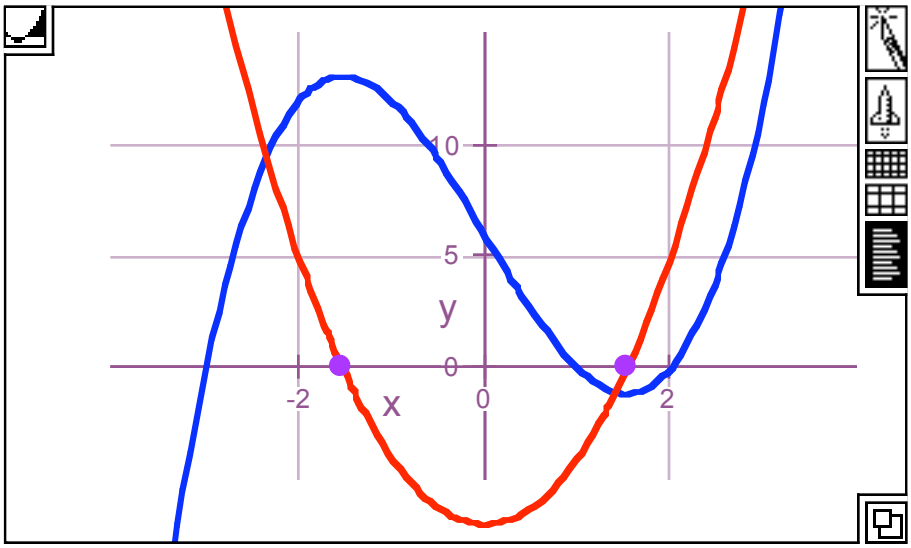
△ $x = 1.5275$ Calculate

○ △ $x = -\frac{1}{3}\sqrt{21}$ Isolate

△ $x = -1.5275$ Calculate

$\text{pointone} = \left(\frac{1}{3}\sqrt{21}, 0\right)$

$\text{pointtwo} = \left(-\frac{1}{3}\sqrt{21}, 0\right)$




□ 4 ... 4 = left...right Stretch to Fit

□ 5 ... 15 = bottom...top cropping Moderately

## Graph Building Blocks

Curve at $(x, y)$ where $x = \text{left} \ldots \text{right}$ with a heavy line, colored Blue.

Curve at $(x, y_1)$ where $x = \text{left} \ldots \text{right}$ with a heavy line, colored Red.

Scatter plot of $(\text{pointone}_{[k_1,1]}, \text{pointone}_{[k_1,2]})$ where $k_1 = 1 \ldots \text{RowsOf}(\text{pointone})$ using 9 point spots colored Purple.

Scatter plot of $(\text{pointtwo}_{[k_1,1]}, \text{pointtwo}_{[k_1,2]})$ where $k_1 = 1 \ldots \text{RowsOf}(\text{pointtwo})$ using 9 point spots colored Purple.