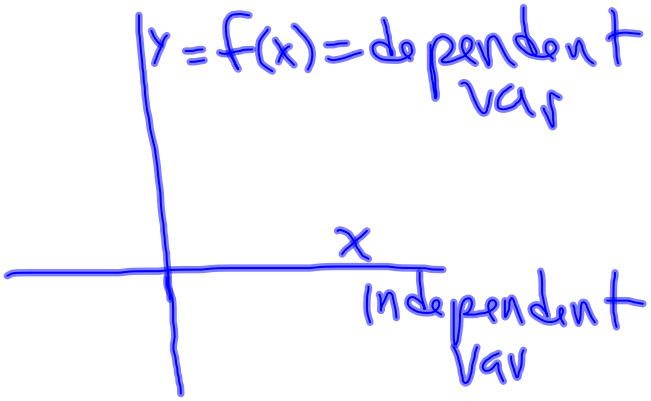
$g(x) = 3x+6$
$g(y) = 3y+6$
$h(t) = 3t+6$

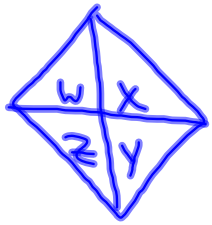
Same function

take independent variable, multiply by 3, add 6

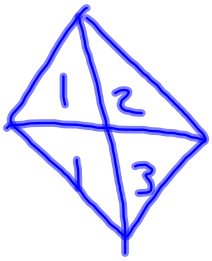


$f(w,x,y,z) = wy - xz$

$f(1,2,3,1) = (1)(3) - (2)(1) = 1$

let 

$= wy - xz$



$= 1$

$x \diamond y = 2x - 3y$

$4 \diamond 5 = 2(4) - 3(5) = 8 - 15 = -7$

$f(x,y) = 2x - 3y$

$f(4,5) = -7$

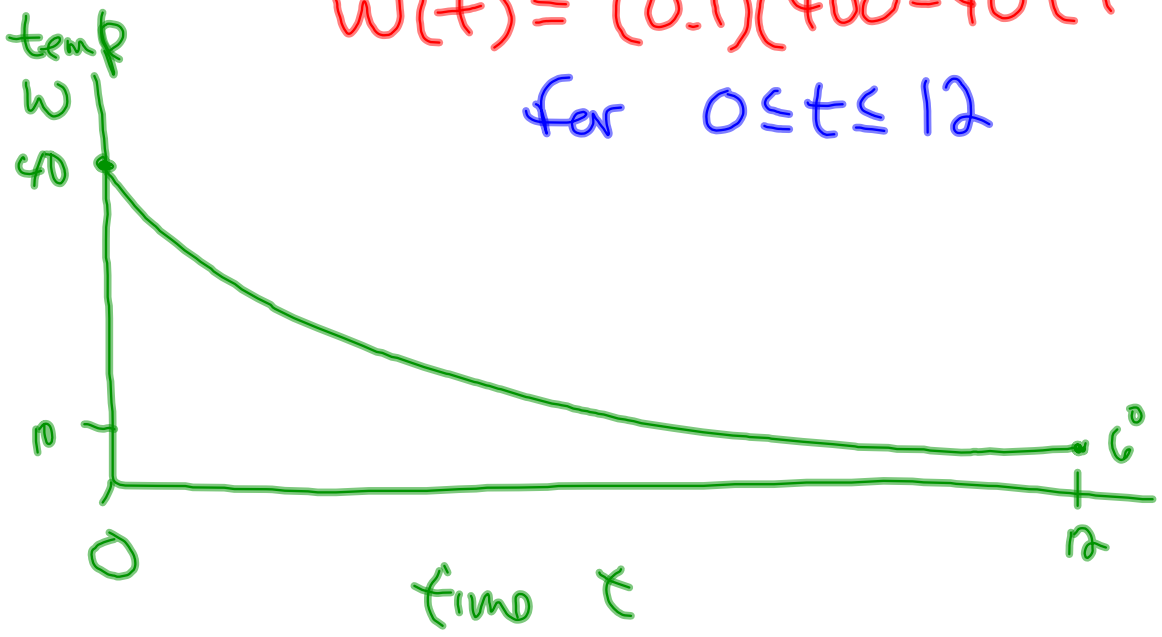
"plug and chug"

using functions as "Models"

The temperature in city X is W(t) degrees t hours after sundown(5:00pm). The function W(t) is given by

$$W(t) = (0.1)(400 - 40t + t^2)$$

for $0 \le t \le 12$



$$w(t) = (0.1)(400 - 40t + t^2)$$

What is the temperature in city X at 7pm?

$t = 2$ $\quad 7pm - 5pm = 2 hrs$

$$w(2) = (0.1)(400 - 40(2) + 2^2)$$
$$= 32.4^\circ$$

What is the temperature in city X at 2am?

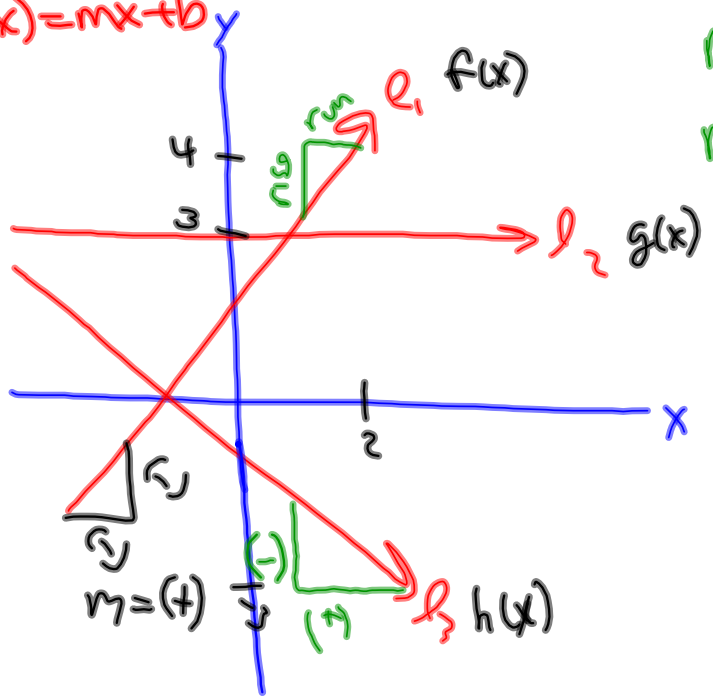
$2am - 5pm = 9 hrs$

$$w(9) = (0.1)(400 - 40(9) + 9^2)$$

linear functions

$y = mx + b$

$f(x) = mx + b$



Slope (m)

$m_{l_1} = (+)$

$m_{l_2} = 0$ rise = 0

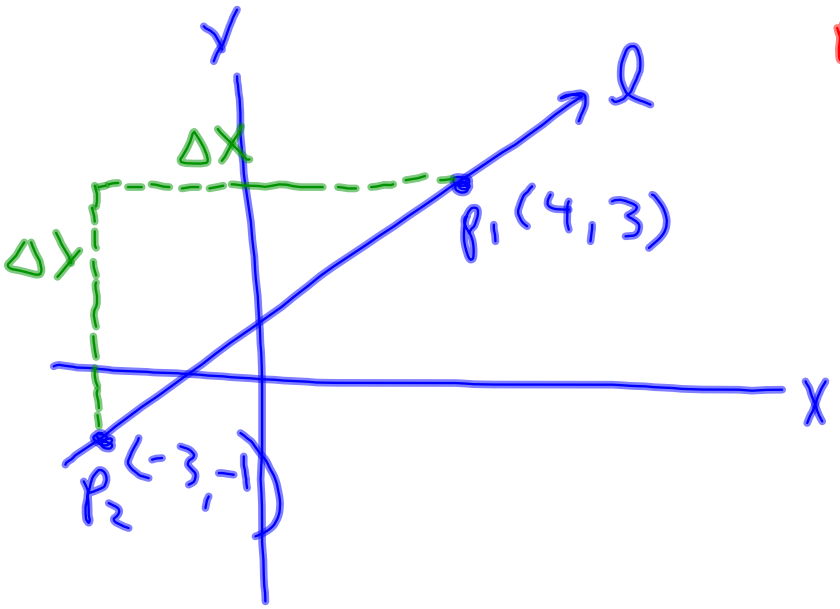
$m_{l_3} = (-)$

$f(2) = 4$

$g(2) = 3$

$h(2) = -3$

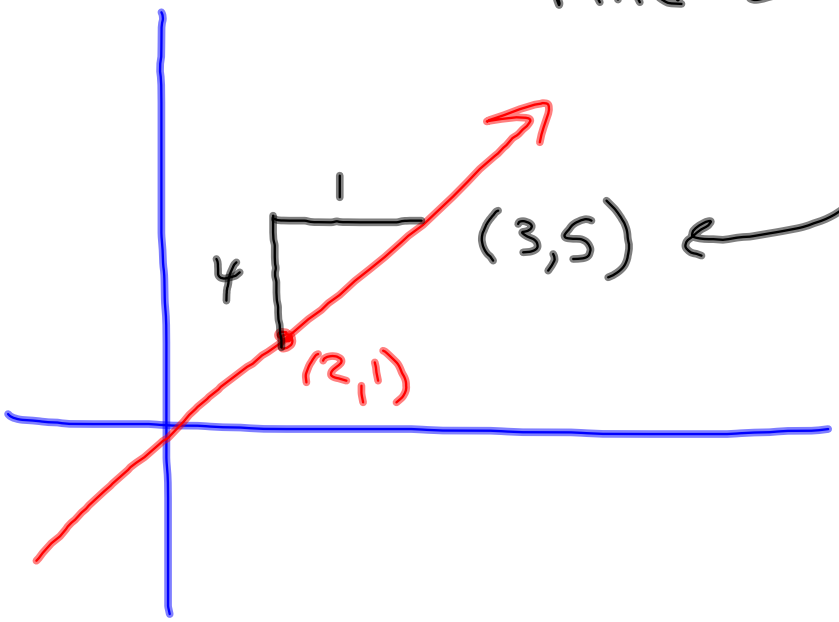
$$m = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$



$$m = \frac{-1-3}{-3-4} = \frac{-4}{-7} = \frac{4}{7}$$

$m = 4 = \frac{4}{1} = \frac{\Delta y}{\Delta x}$

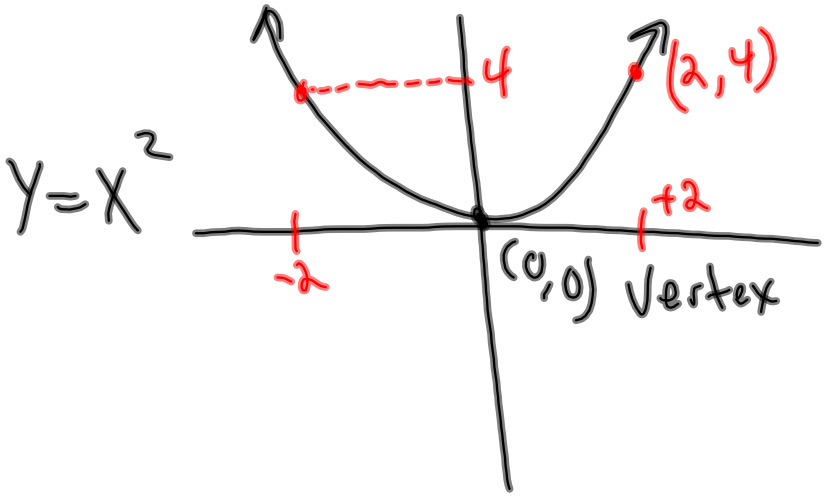
find 2nd point



Parabolas

$f(x) = ax^2 + bx + c$

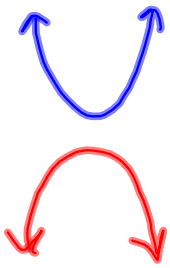
$y = ax^2 + bx + c$



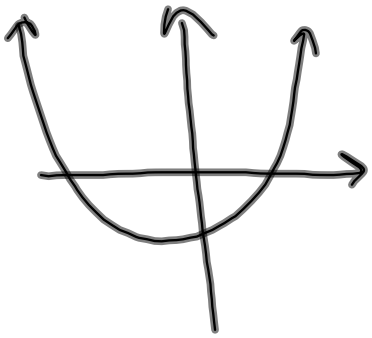
$f(x) = ax^2 + bx + c$

if $a > 0$ parabola is concave up

if $a < 0$ parabola is concave down



if $x = 0$ $f(x) = c$ $y = c$ y-intercept !!



$\Rightarrow$ $a > 0$

$c > 0$

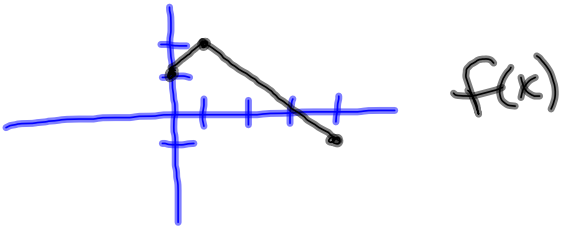
$f(x) = 3x^2 - 6x + 2$?

NO

$f(x) = -3x^2 + 6x - 2$?

NO

translations



Domain - [0, 4] $\{x: 0 \leq x \leq 4\}$

Range - [-1, 2] $\{y: -1 \leq y \leq 2\}$

$f(0) = 1$

$f(1) = 2$

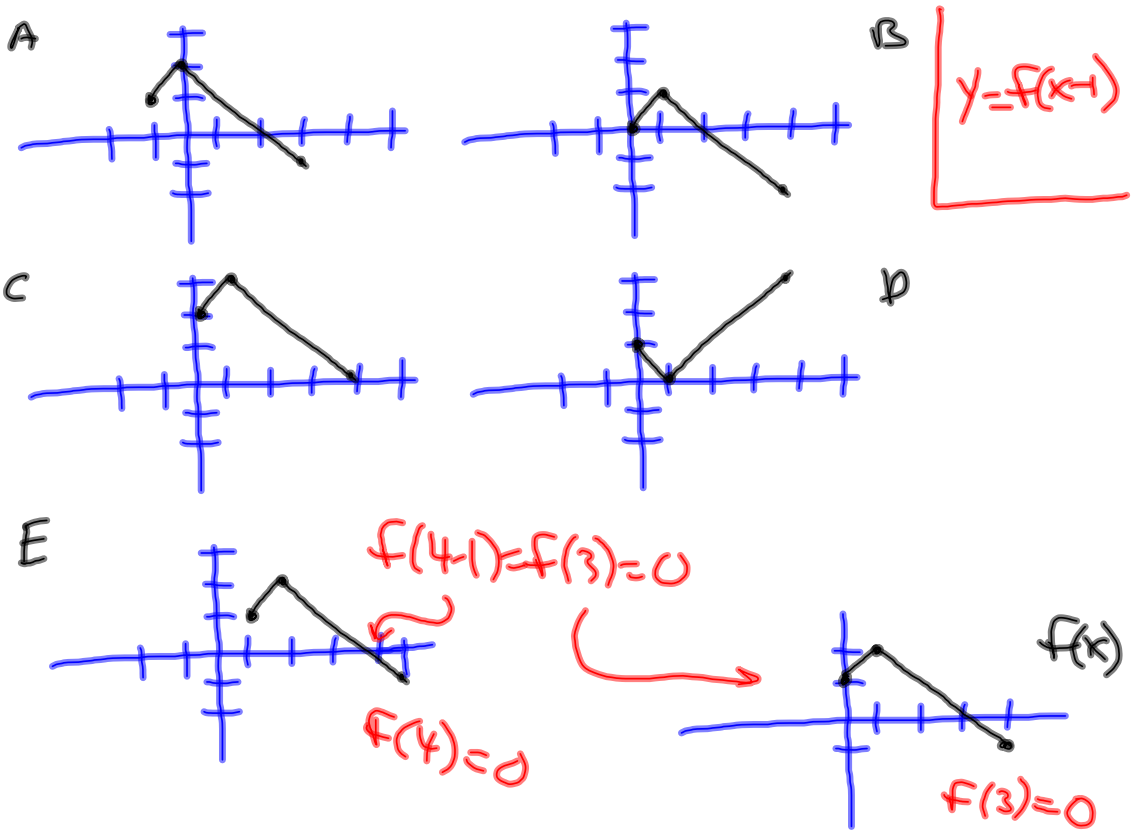
$f(3) = 0$

$f(x) \Rightarrow f(x-h)$

slide h to the right

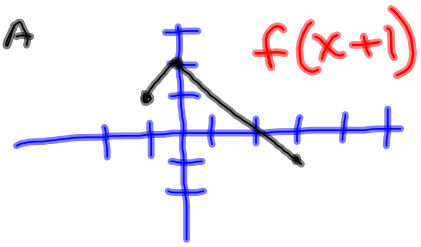
$f(x) \Rightarrow f(x)+k$

slide k up



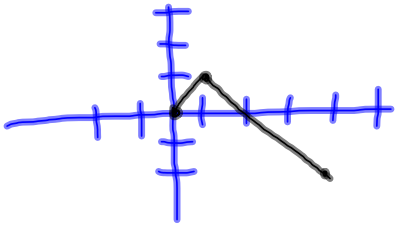
Jul 12-10:46 AM

A



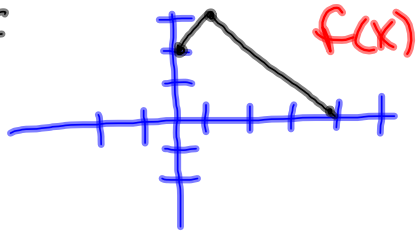
f(x+1)

B



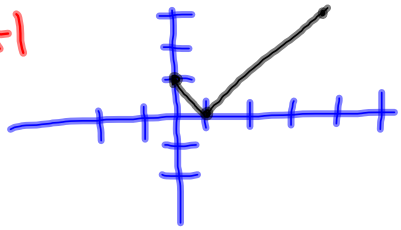
f(x)−1

C



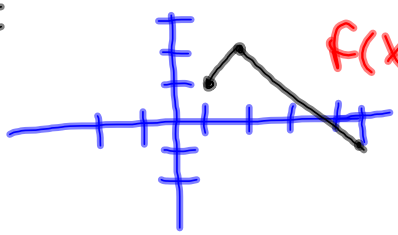
f(x)+1

D

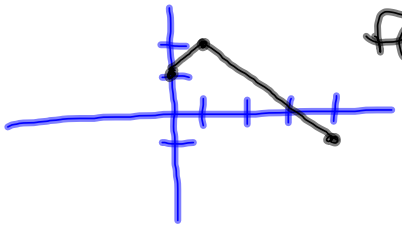


Reflection

E



f(x−1)



f(x)