Linear Functions

$y = mx + b$

x: independent var / input

y: dependent var / output

$f(x) = mx + b$

$f(x) = y$

$f(2) = 4 \Rightarrow (2, 4)$

$x = 2 \quad y = 4$

$f(3) = 7 \Rightarrow (3, 7)$

$f\left(\frac{2}{5}\right) = -\frac{2}{5} \quad \left(\frac{2}{5}, -\frac{2}{5}\right)$

$f(2\pi) = -7/152 \quad (2\pi, -7/152)$

$f(4)=1$ $f(8)=7$ what is $f(x)$?

$(4,1)$ $(8,7)$

we need slope & y-int

find slope first

$$m=\frac{y_2-y_1}{x_2-x_1}=\frac{7-1}{8-4}=\frac{6}{4}=3/2$$

find b by plugging point & slope into $y=mx+b$

$(4,1)$ $m=\frac{3}{2}$

$1=\frac{3}{2}(4)+b$

$1=6+b$

$b=-5$

~~$x=\frac{3}{2}x-5$~~

$$f(x)=\frac{3}{2}x-5$$

$g(0)=5$ (point) and an increase of 4 units in x causes a decrease of 12 units in $g(x)$. 4 over 12 down

$(0,5)$ $\quad m=\frac{\text{rise}}{\text{run}}=\frac{-12}{4}=-3$

$y=mx+b$

$5=-3(0)+b$

$5=b$

$$\boxed{g(x)=-3x+5}$$

your turn

1. $f(0)=1$; $f(x)$ increases by 6 when x increases by 3.

2. $f(-2)=3$ $f(2)=-3$