

BONUS: The background color of the class webpage is: WHITE

1. True or False (Please show your work)

(a) The point $(2, -1)$ lies on the graph $f(x) = 2x - 1$.**FALSE**Plug in $x=2$

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

So $(2, 3)$ is on $f(x)$, not $(2, -1)$.

(b) The data in the following table are linear.

x	-1	0	3	5
y	10	8	2	-2

TRUE

$$\frac{\Delta y}{\Delta x} = \frac{-2}{1} = -2$$

$$\frac{\Delta y}{\Delta x} = \frac{-6}{3} = -2$$

$$\frac{\Delta y}{\Delta x} = \frac{-4}{2} = -2$$

There is a constant slope: The $\frac{\Delta y}{\Delta x}$ is always -2 .

(c) The function $g(x) = \sqrt{3x - 7}$ has a domain of $x \geq \frac{7}{3}$.The domain is WHAT WORKS for x -values.

$$\text{So I need } 3x - 7 \geq 0$$

$$3x \geq 7$$

$$x \geq \frac{7}{3}$$

TRUE

2. My bathtub has 30 gallons of water in it. I pull the plug at time 0, and the bathtub empties at a rate of 4 gallons every minute.

(a) How much water is in the tub after 2 minutes and thirty seconds?

$$2\frac{1}{2} \text{ minute I lose } (2.5)(4) = 10 \text{ gallons}$$

$$\text{So there are } 30 - 10 = \boxed{20 \text{ gallons remaining}}$$

(b) Write an expression for the amount of water in the tub as a function of time.

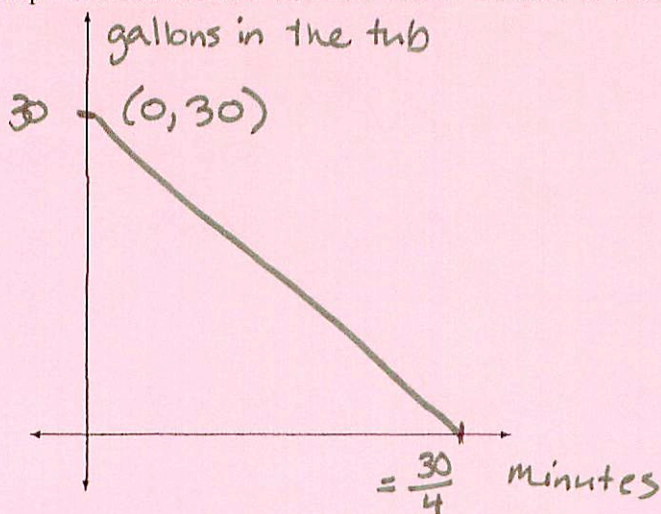
$$f(t) = 30 - 4t$$

↑ ↑ ↖
input initial amount rate of loss

(c) Explain what $f(3) = 18$ means in real word terms.

$f(3) = 18$ means after 3 minutes there are 18 gallons in the tub.

(d) Graph the function on the axis below. Be sure to label real world quantities on the axis.



(e) Find and label the x and y intercepts. Explain what these intercepts represent in this situation.

The y-int is 30 gallons: it is the starting amount in the tub.

The x-int is $\frac{30}{4} = 7.5$ minutes. It is when the tub is empty.