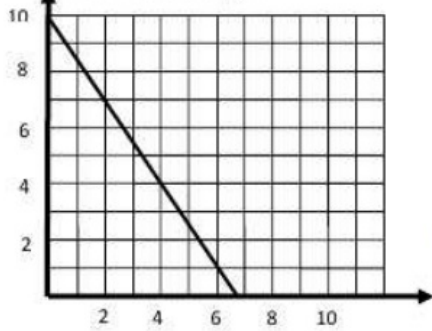


- 1) The water in the bathtub is 10 inches deep. The water in the bathtub is drained at a constant rate until the bathtub is empty. The graph below shows the water level $L(t)$ in the bathtub as a function of time (t).



Which of these functions represents the relationship between the time and water level?

~~A. $L(t) = \frac{3}{2}t + 10$~~

B. $L(t) = -\frac{3}{2}t + 10$

~~C. $L(t) = \frac{3}{2}t - 10$~~

~~D. $L(t) = -\frac{3}{2}t - 10$~~

$y = mx + b$
 $-2 = 4(3) + b$
 $-2 = 12 + b$
 $-14 = b$

- 2) The graph of a line passes through the point $(3, -2)$ and has slope 4. Which of the following is the correct equation of the line?

A. $y = 4x + 14$

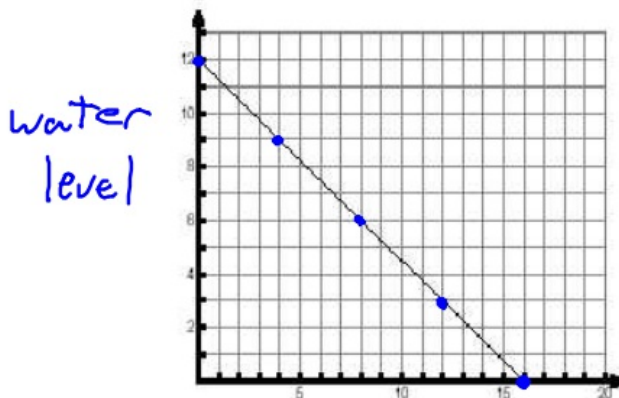
B. $y = 4x + 13$

C. $y = 4x - 14$

D. $y = 4x - 11$

x y m

- 3) The water in a swimming pool is 12 feet deep. The water in the pool is drained at a constant rate until the pool is empty. The graph below shows the water level $L(t)$ in the tank as a function of time (t).



a) What does the y-intercept mean in context of the problem?

height of water before it started draining.

b) What does the x-intercept mean in context of the problem?

how long it took for the water to completely drain.

c) What does the slope mean in context of the problem?

$-\frac{3}{4} = -0.75$

drain 3ft every 4 hours.
 drains 0.75ft each hour.

- 4) An automobile decreases in value once it is purchased (it depreciates). The value (Y) of a 2003 BMW Z4 is a linear function of the number of years (x) since it was purchased. The equation $y = -2000x + 35000$ represents the value of the car over time.

- At what rate is the 2003 BMW Z4 depreciating? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

(Slope) goes down $2,000$ each year.

- What was the value of the 2003 BMW Z4 when it was purchased? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

$\$35,000$ - original amount the car sold for in 2003
 $y=0$

- When will the 2003 BMW Z4 have a value of zero? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

$$0 = -2000x + 35000$$

$$-35000 = -2000x$$

$$17.5 \text{ years} = x$$

→ year 2020

- 5) Write the equation of a line in slope intercept form with points (1,1) and (3,11)

$$m = \frac{11-1}{3-1} = \frac{10}{2} = 5$$

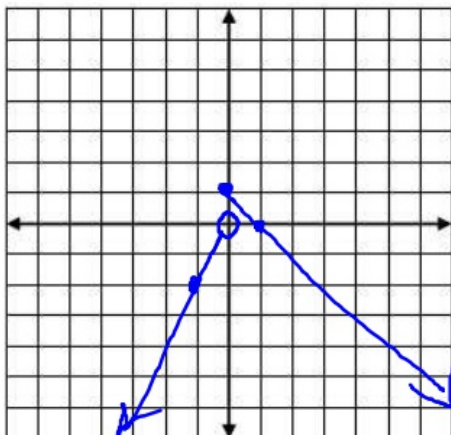
$$1 = 5(1) + b$$

$$1 = 5 + b$$

$$-4 = b$$

$$y = 5x - 4$$

$$6) y = \begin{cases} 2x, & x < 0 \\ -x+1, & x \geq 0 \end{cases}$$



$$7) y = \begin{cases} -1, & x < -2 \\ 1, & -2 \leq x < 2 \\ 4, & x \geq 2 \end{cases}$$

