

Application of Linear Equations Worksheet

- 1) Suppose the water level of a river is 34 feet and that is receding at a rate of 0.5 foot per day.

- a) Write an equation to represent the water level of the river.

$$y = 34 - 0.5x$$

let y : water level of river
 x : days

- b) When will the water level be 26 feet deep?

$$\begin{aligned} 26 &= 34 - 0.5x \\ -8 &= -0.5x \end{aligned} \quad \rightarrow \quad x = 16$$

After 16 days the water level will be 26ft deep.

- c) If this rate continue, when will the river be all dried up?

when $y = 0$, solve for x

$$\begin{aligned} 0 &= 34 - 0.5x \\ -34 &= -0.5x \\ x &= 68 \end{aligned}$$

The river will dry up after 68 days

- 2) A plumber charges \$25 for a service call plus \$50 per hour of service.

- a) Write an equation for the cost of service, C , after h hours of service.

$$C = 50h + 25$$

- b) The plumber charged \$137.50. How long did he work?

$$\begin{aligned} 137.50 &= 50h + 25 \\ 112.50 &= 50h \\ h &= 2.25 \end{aligned}$$

The plumber worked for 2.25 hours

- 3) Attorney A charges a fixed fee of \$250 for an initial meeting and \$150 per hour for all hours worked after that. Attorney B charges \$150 for the initial meeting and \$175 per hour for all hours worked after that. Let C represent what they attorneys charge and h represent the number of hours worked.

- a) Write an equation to represent what Attorney A charges.

$$C = 150h + 250$$

- b) Write an equation to represent what Attorney B charges.

$$C = 175h + 150$$

- c) Find the charge for 26 hours of work for each attorney.

Attorney A

$$C = 150(26) + 250$$

$$C = \$4150$$

Attorney B

$$C = 175(26) + 150$$

$$C = \$4700$$

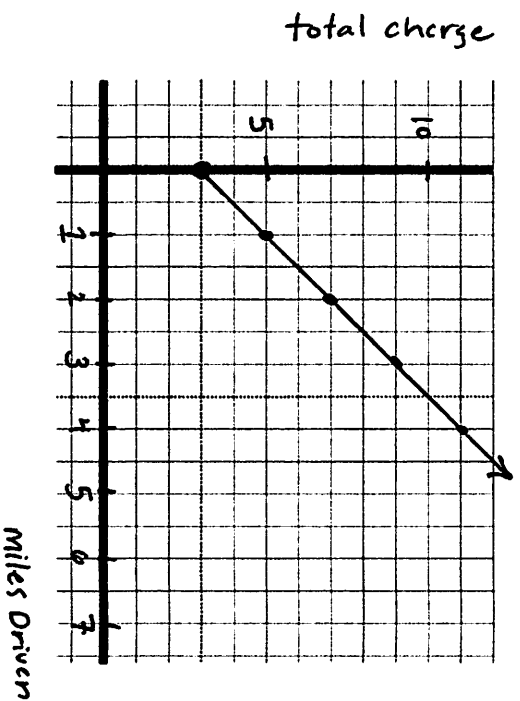
- 4) A cab company charges a \$3 boarding rate, in addition to \$2 for every mile.

- a) Write an equation to represent the cost of a cab.

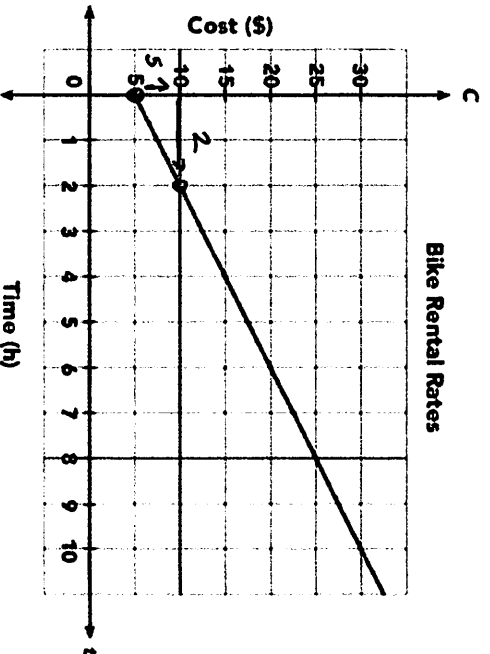
$$C = 2m + 3$$

let C: total charge
m: # miles driven

- b) Graph your equation below. Be sure to label your axis.



- 5) A bike rental company's rental rates are shown below.



- a) Write an equation to represent the cost, C, of renting a bike for h hours.

$$C = 2.50h + 5$$

- b) What is the y-intercept? And what does it represent in the context of this problem?

(0, 5) it represents a fee to rent the bicycle

- c) What is the slope? What does it represent in the context of this problem?

2.50, for every ^{hour} the bicycle is rented, the customer is charged \$2.50