

Applications of Linear Equations

Example 1: Bennett and his friends decide to go bowling. The cost for the group is \$15 for shoe rentals plus \$4.00 per game.

a. What is the y-intercept for this scenario?

\$15 no matter what

b. What is the slope for this scenario?

\$4.00 per game

$$C = 4g + 15$$

$$y = mx + b$$

c. Write an equation relating the total cost, C, of the outing to the number of games bowled, g.

$$C = 4g + 15 \Rightarrow y = 4x + 15$$

d. How much will it cost them to bowl two games?

$$C = 4(2) + 15$$

$$C = 8 + 15$$

$$C = \$23$$

e. How many games can they bowl if they have \$35.00?

$$35 = 4g + 15$$

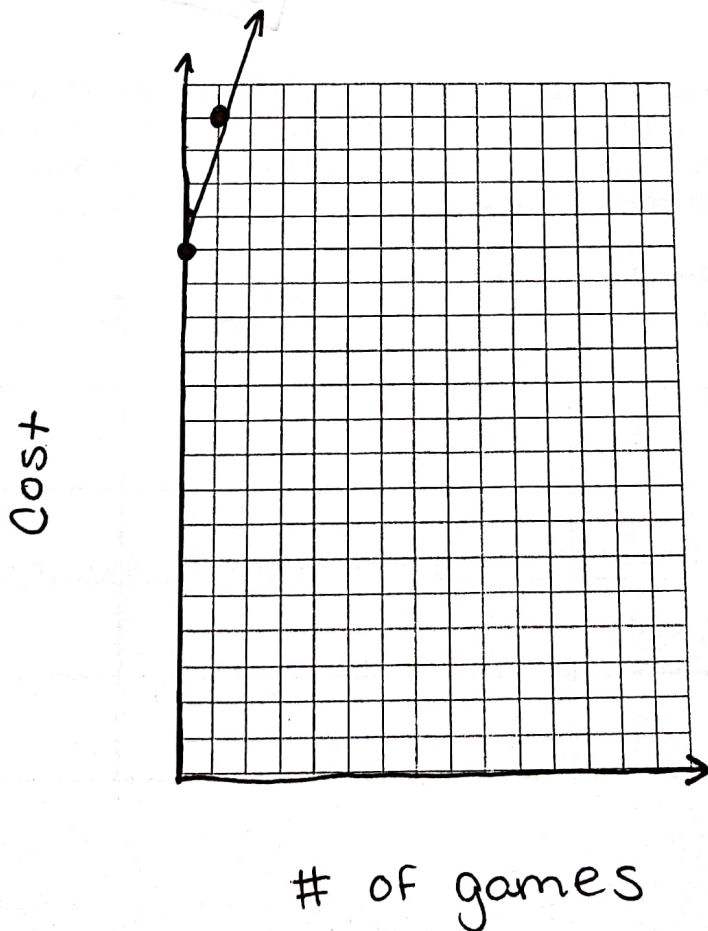
$$\begin{array}{r} 35 \\ -15 \\ \hline 20 \end{array} = \begin{array}{r} 4g \\ -15 \\ \hline 4g \end{array}$$

$$\frac{20}{4} = \frac{4g}{4}$$

$$g = 5$$

we can
play 5 games
with \$35

f. Graph the equation.



Example 2: The volume in a fish tank can be represented as $V = 520 - 10t$, where V is the volume in cubic inches and t is time in minutes.

- a. What is the y-intercept for this scenario? What does it mean in context of the problem?
520, starting amount of water
- b. What is the slope for this scenario? What does it mean in the context of the problem?
-10, how fast the water is leaving the tank
- c. How much water is in the tank after 5 minutes?
 $V = 520 - 10(5)$
 $V = 470$ cubic inches

Example 3. A school can seat 50 students in every bus.

- a. Write an equation that represents the number of students, S, able to go on the field trip based on the number of buses, b.
 $y = mx + b$ every bus takes 50 students
 $S = 50b$
of students buses
- b. If the school is planning on taking 360 students on a field trip to the Polynesian Cultural Center, how many buses will they need?
 $\frac{360}{50} = \frac{50b}{50}$
8 buses

Example 4: The state department of transportation recently filled the road salt storage building on the highway near your house with 2400 tons of road salt. A truck can hold 12 tons of road salt in one load. You can represent this relationship with the equation $y = 2400 - 12x$, where y is the amount of road salt left in the storage building and x is the number of truck loads of salt.

a. Complete the table below.

x	work	y
0		
15		
30		
45		