

The cost of going to the fair is represented by the equation $C(x) = 3x + 5$ where x = the number of rides you choose to go on.

1. What is $C(4)$?

$$C(x) = 3x + 5$$

2. If $C(x) = 29$, what is x ?

3. If you went on 6 rides, how much did it cost?

4. If you spent \$11 at the fair, how many rides did you ride?

Writing Linear Equations

EQ: How do I write an equation for a situation with a constant change?

What am I learning today?

How to write a linear equation using parameters from a scenario, graph, or table.

How will I show that I learned it?

Create a function in function notation that models a linear relationship

Parameter: a term in a function that determines a specific form of a function but not the nature of the function. The numbers that give a function its shape.

$$y = mx + b \quad \text{pg. 88}$$

For a linear function: m and b are the parameters (slope and y -intercept). Changing the parameters changes the function and the graph.

What is the slope-intercept format for linear equations?

$$y = mx + b$$
$$f(x) = mx + b$$

What does each part of the equation represent?

output

slope

input

y-int

Writing linear equations from a situation:

$$y = mx + b$$

m = the thing that is changing over time

b = the thing that occurs once and doesn't change.

Writing Linear Equations: $C(x) = 3x + 5$

Step 1: Find what two items will be changing. These are your variables. (x and y)

Step 2: Find what amount is changing each time the variable changes. This is your slope. (m)

Step 3: Find what amount you pay once or start with. This is your intercept. (b)

Step 4: Write as $y = mx + b$.

Ex. A You are going to Dave and Busters. You buy a \$10 meal deal and then pay \$0.10 for each additional token. Write an equation that represents this if $t = \#$ of tokens bought.

$$C(t) = .10t + 10$$

If you buy 50 tokens, how much will it cost?

$$C(50) = .10(50) + 10 = \$15$$

If you spend \$17.50, how many tokens can you get?

$$\begin{array}{r}
 C(t) = .10t + 10 \\
 \boxed{17.50 = .10t + 10} \\
 \begin{array}{r}
 -10 \qquad \qquad -10 \\
 \hline
 7.50 = \cancel{.10}t \\
 .10 \qquad \qquad \cancel{.10}
 \end{array}
 \end{array}
 \quad t = 75 \text{ tokens}$$

Ex. B You are paying your monthly cell bill. Sprint charges you \$25 for unlimited minutes plus 5 cents for every text you send. Write an equation for this if $t = \#$ of texts sent.

$$C(t) = .05t + 25$$

If you send 2503 texts, how much will it cost?

$$C(2503) = .05(2503) + 25 = \$150.15$$

How many texts did you send if you paid \$42?

$$\begin{array}{r}
 42 = .05t + 25 \\
 -25 \qquad \qquad -25 \\
 \hline
 17 = .05t \\
 \frac{17}{.05} = \frac{.05t}{.05} \\
 t = 340 \text{ texts}
 \end{array}$$

Ex. C You just passed your driver's test. For the first month of driving, you need to pay \$120 for the insurance plus 20 cents per mile. Write an equation for the cost if $m = \#$ of miles driven.

$$C(m) = .20m + 120$$

If you drive 200 miles in the month, how much will that cost?

$$C(200) = \underline{.20(200)} + 120 = \$160$$

If you earn \$7 per hour at Subway, how many hours will you have to work to pay for gas?

\$40 gas
at least 6 hours

Example 4:

You visit a pick-your-own apple orchard. There is an entrance fee of $\$5.00$, plus you pay $\$0.50$ for each apple you pick. Write a function to represent this scenario. What do the parameters represent in the context of the problem?

$a = \#$ of apples I pick

$$C(a) = .50a + 5$$

m
\$.50 per apple

b
entrance fee

Example 5:

You rent out the Whirleyball complex for your birthday. You pay \$200 for the hour that you get on the whirleyball court and \$8 for each game of lasertag your friends play. You only have time for 50 games of lasertag. What are the parameters for this equation?

$$C(g) = 8g + 200$$

\uparrow $8(50) + 200$ \uparrow $\$600$