

Lesson Summary

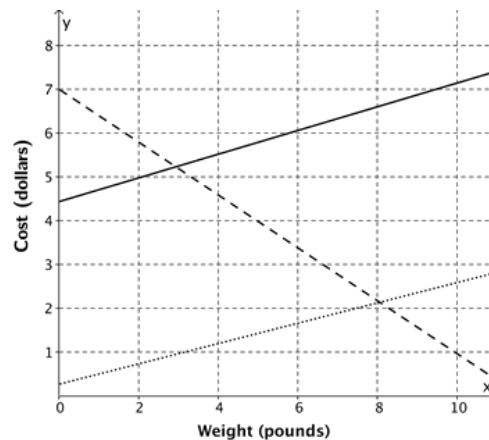
A linear function can be used to model a linear relationship between two types of quantities. The graph of a linear function is a straight line.

A linear function can be constructed using a rate of change and an initial value. It can be interpreted as an equation of a line in which:

- The rate of change is the slope of the line and describes how one quantity changes with respect to another quantity.
- The initial value is the y -intercept.

Problem Set

1. Recall that Lenore was investigating two wireless access plans. Her friend in Europe says that he uses a plan in which he pays a monthly fee of 30 euro plus 0.02 euro per minute of use.
 - a. Construct a table of values for his plan's monthly cost based on 100 minutes of use for the month, 200 minutes of use, and so on up to 1,000 minutes of use. (The charge of 0.02 euro per minute of use is equivalent to 2 euro per 100 minutes of use.)
 - b. Plot these 10 points on a carefully labeled graph, and draw the line that contains these points.
 - c. Let x represent minutes of use and y represent the total monthly cost in euro. Construct a linear function that determines monthly cost based on minutes of use.
 - d. Use the function to calculate the cost under this plan for 750 minutes of use. If this point were added to the graph, would it be above the line, below the line, or on the line?
2. A shipping company charges a \$4.45 handling fee in addition to \$0.27 per pound to ship a package.
 - a. Using x for the weight in pounds and y for the cost of shipping in dollars, write a linear function that determines the cost of shipping based on weight.
 - b. Which line (solid, dotted, or dashed) on the following graph represents the shipping company's pricing method? Explain.



3. Kelly wants to add new music to her MP3 player. Another subscription site offers its downloading service using the following: $\text{Total Monthly Cost} = 5.25 + 0.30 (\text{number of songs})$.
- Write a sentence (all words, no math symbols) that the company could use on its website to explain how it determines the price for MP3 downloads for the month.
 - Let x represent the number of songs downloaded and y represent the total monthly cost in dollars. Construct a function to model the relationship between the number of songs downloaded and the total monthly cost.
 - Determine the cost of downloading 10 songs.
4. Li Na is saving money. Her parents gave her an amount to start, and since then she has been putting aside a fixed amount each week. After six weeks, Li Na has a total of \$82 of her own savings in addition to the amount her parents gave her. Fourteen weeks from the start of the process, Li Na has \$118.
- Using x for the number of weeks and y for the amount in savings (in dollars), construct a linear function that describes the relationship between the number of weeks and the amount in savings.
 - How much did Li Na's parents give her to start?
 - How much does Li Na set aside each week?
 - Draw the graph of the linear function below (start by plotting the points for $x = 0$ and $x = 20$).

