Chapter 1

Functions and Graphs

Exercise Solution

Exercise 1.1.57

Instruction

The manager at a skateboard shop pays his workers a monthly salary S of \$750 plus a commission of \$8.50 for each skateboard they sell.

(a) Write a function $y = S(x)$ that models a worker's monthly salary based on the number of skateboards x he or she sells.

(b) Find the monthly salary when a worker sells 25, 40, or 55 skateboards.

(c) Use the INTERSECT feature on a graphing calculator to determine the number of skateboards that must be sold for a worker to earn a monthly income of \$1400. (Hint: Find the intersection of the function and the line $y = 1400$.)

Solution

(a) The workers have a base salary plus a commission based on number of skateboards sales. The function will be the constant base salary plus a product depending x being number of skateboards sold,

$$y = S(x) = 750 + 8.50 \cdot x.$$

(b) Having the formula from above we can calculate monthly salary for the different amount of skateboards sold,

$$S(25) = 750 + 8.50 \cdot 25 = 962.5,$$

$$S(40) = 750 + 8.50 \cdot 40 = 1090,$$

$$S(55) = 750 + 8.50 \cdot 55 = 1217.5.$$

(c) Using a graphing calculator to graph our function and the liny $y = 1400$ we note that there will be two lines than intersect at the point $(76.47, 1400)$. We can conclude that a worker will need to sell 77 skateboards to earn \$1400.

Answer

(a) $y = S(x) = 750 + 8.50 \cdot x$.

(b) \$962.5, \$1090, \$1217.50.

(c) 77 skateboards.