2.2.39

Exercise 2.2.39 Let C be the function whose graph is given below. This graph represents the cost C of using gigabytes of data in a month for a data-only plan.

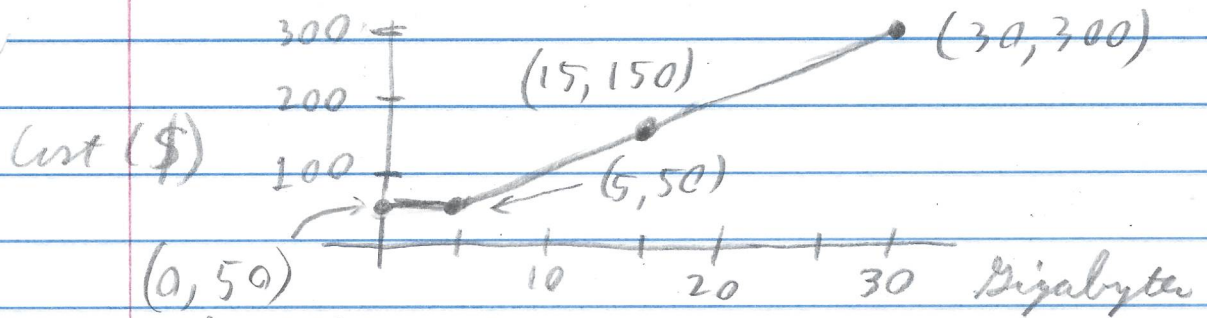
(a) Find C(0). Interpret this value.

(b) Find C(5). Interpret this value.

(c) Find C(15). Interpret this value.

(d) What is the domain of C? What does this domain imply in terms of the number of gigabytes?

(e) Describe the shape of the graph.



Solution

(a) Since (0, 50) is a point on the graph of C(x) then $\boxed{C(0) = 50}$. In if $x = 0$ gigabytes are used then the cost is \$50.

(b) Since (5, 50) is a point on the graph of C(x) then $\boxed{C(5) = 50}$. In if $x = 5$ gigabytes are used then the cost is \$50.

2.2.39 continued

(c) Since (15, 150) is a point on the graph of $C(x)$ then $\boxed{C(15) = 150}$. $\boxed{\text{If } x = 15 \text{ gigabytes are used then the cost is \$150.}}$

(d) The domain of C is the set of x-values where C is defined. Based on the graph, C is defined for $0 \le x \le 30$ gigabytes, so the $\boxed{\text{domain of } C \text{ is the interval } [0, 30]}$. This implies that the maximum number of gigabytes that can be used in a month is 30.

(e) The graph consists of two linear pieces. The graph is a constant of 50 for $0 \le x \le 5$. For $5 \le x \le 30$ the graph increases at a constant rate of \$20 per gigabyte (since the slope is $m = \frac{(300) - (150)}{(30) - (15)} = \frac{150}{15} = 10$). □