

Exercise 2.1.117 Suppose that the revenue  $R$ , in dollars, from selling  $x$  smartphones, in hundreds, is  $R(x) = -1.2x^2 + 220x$ .

The cost  $C$ , in dollars, of selling  $x$  smartphones, in hundreds, is

$$C(x) = 0.05x^3 - 2x^2 + 65x + 500.$$

(a) Find the profit function,  $P(x) = R(x) - C(x)$ .

(b) Find the profit if  $x = 15$  hundred smartphones are sold.

(c) Interpret  $P(15)$ .

Solution

(a) The profit function is

$$P(x) = R(x) - C(x) \text{ or}$$

$$P(x) = (-1.2x^2 + 220x) - (0.05x^3 - 2x^2 + 65x + 500) \text{ or}$$

$$P(x) = -0.05x^3 + 0.8x^2 - 155x - 500.$$

(b) When  $x = 15$  hundred smartphones,

$$P(15) = -0.05(15)^3 + 0.8(15)^2 - 155(15) - 500$$

$$= -0.05(3375) + 0.8(225) - 2325 - 500$$

$$= -168.75 + 180 - 2325 - 500 = -3214.50.$$

(c) Since  $P(15) = -3214.50$  (dollars), then

if  $x = 15$  hundred smartphones are made and sold, there will be a loss of \$3214.50

for the company.  $\square$