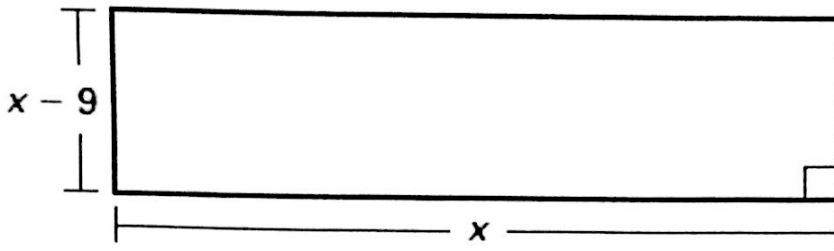


1. Find the dimensions of the rectangle if the area = 36 square feet.



2. From 1970 to 1990, the average cost of a new car,  $C$  (in dollars), can be approximated by the model  $C = 30.5t^2 + 4192$ , where  $t$  is the number of years since 1970. During which year was the average cost of a new car \$20,000?

3. Suppose you are tossing an apple up to a friend on a third-story balcony. After  $t$  seconds, the height of the apple in feet is given by  $h = -16t^2 + 38.4t + 0.96$ . Your friend catches the apple just as it reaches its highest point.

Initial height of the apple? \_\_\_\_\_

Time it takes to reach maximum height? \_\_\_\_\_

Maximum height? \_\_\_\_\_

Time it takes to reach the ground? \_\_\_\_\_

4. The barber's profit  $p$  each week depends on his charge  $c$  per haircut. It is modeled by the equation  $p = -200c^2 + 2400c - 4700$ . What price should he charge for the largest profit?

5. The path of a baseball after it has been hit is modeled by the function  $h = -0.0032d^2 + d + 3$ , where  $h$  is the height in feet of the baseball and  $d$  is the distance in feet the baseball is from home plate.

Initial height of the baseball? 3 ft

Distance from home plate when baseball is at maximum height? 156.3 ft

Maximum height? 81.1 ft

Distance from home plate when the ball hits the ground? 315.5 ft

Height of baseball when distance from home plate is 12 ft? 14.5 ft

6. A lighting fixture manufacturer has daily production costs of  $C = 0.25n^2 - 10n + 800$ , where  $C$  is the total daily cost in dollars and  $n$  is the number of light fixtures produced. How many fixtures should be produced to yield a minimum cost?

7. A model for a company's revenue is  $R = -15p^2 + 300p + 12,000$ , where  $p$  is the price in dollars of the company's product.

Revenue when the price is \$0? \_\_\_\_\_

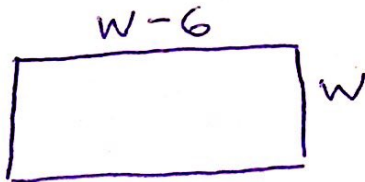
Price that will maximize revenue? \_\_\_\_\_

Maximum revenue? \_\_\_\_\_

Price when revenue is \$0? \_\_\_\_\_

Revenue when the price is \$7? \_\_\_\_\_

8. If a rectangle's length is 6 inches less than its width and the area of the rectangle is 27, what are the dimensions of the rectangle?



width	9 in
length	3 in

$$w(w-6) = 27$$

$$w^2 - 6w = 27$$

$$\begin{array}{r} -27 \\ \hline \end{array} \quad \begin{array}{r} -27 \\ \hline \end{array}$$

$$w^2 - 6w - 27 = 0$$

$$(w-9)(w+3) = 0$$

$$w = 9 \quad w = \cancel{3}$$