

8.5 Linear Functions and Models (Additional Practice)

In the Valencia area, an 802 square foot apartment rents for \$1,389 per month. A 1,007 square foot apartment rents for \$1,694 per month. Suppose that the relation between area and rent is linear.

use
 $(802, 1389)$
 $(1007, 1694)$

- a) Find a linear function that relates the rent of a Valencia apartment, R , to its area, x . Round decimals to the nearest hundredth.

$R(x)$

Find the slope: $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1694 - 1389}{1007 - 802} = \frac{305}{205} = 1.49$

Choose a point: $(802, 1389)$

$$y - y_1 = m(x - x_1)$$

$$y - 1389 = 1.49(x - 802)$$

$$y - 1389 = 1.49x - 1194.98$$

$$y = 1.49x + 194.02$$

$$R(x) = 1.49x + 194.02$$

- b) Predict the rent of a 950 square foot apartment in Valencia. Round your answer to the nearest dollar. Summarize your answer using a complete sentence and appropriate units.

$$\text{let } x = 950$$

$$\begin{aligned} R(950) &= 1.49(950) + 194.02 \\ &= 1609.52 \end{aligned}$$

The rent of a 950 sq ft apartment will be approximately \$1,610.

- c) If the rent of a Valencia apartment is \$1,500 per month, how large would you expect it to be? Round to the nearest square foot. Summarize your answer using a complete sentence and appropriate units.

$$\text{let } R(x) = 1500. \text{ Solve for } x$$

$$R(x) = 1.49x + 194.02$$

$$1500 = 1.49x + 194.02$$

$$1305.98 = 1.49x$$

$$x = \frac{1305.98}{1.49}$$

$$x \approx 876$$

The apartment will be approximately 876 sq. feet.