

Sec 5.4.2

Applications of Nonlinear Systems

The sum of two numbers is 20 and their product is 96. Determine the two numbers.

$$x + y = 20 \rightarrow x = 20 - y$$

$$xy = 96$$

$$(20 - y)y = 96$$

$$20y - y^2 = 96$$

$$0 = y^2 - 20y + 96$$

$$(y - 12)(y - 8)$$

$$y = 12, 8$$

$$\begin{matrix} (8, 12) \\ (12, 8) \end{matrix}$$

The perimeter of a rectangle is 26 meters and its area is 40 square meters. Determine its dimensions.

$$2l + 2w = 26$$

$$lw = 40 \rightarrow$$

$$w \left[2 \left(\frac{40}{w} \right) + 2w = 26 \right] w$$

$$80 + 2w^2 = 26w$$

Suggested Practice

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43,55,~~57~~

Answers-

43. 4 and 6

55. (0,-4),(-2,0) and (2,0)

~~57. 11 ft and 7 ft.~~

