

2.6: Geometry Problems

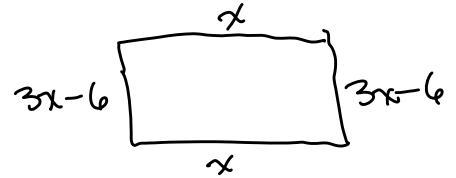
Note Title

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(we skip most of 2.6)

Example: The perimeter of a rectangle is 100 meters. The length is 6 meters less than ~~three times~~ the width. Find the length and width.

length: $3x-6$
width: x



length $\xrightarrow{\text{compare to}}$ width
 x

Perimeter = sum of all side lengths

$$\begin{aligned} 100 &= x + (3x-6) + x + (3x-6) \text{ or} \\ 100 &= x + 3x - 6 + x + 3x - 6 \\ 100 &= 8x - 12 \end{aligned}$$

$$\begin{aligned} P &= 2(\text{length}) + 2(\text{width}) \\ 100 &= 2(3x-6) + 2x \\ 100 &= 6x - 12 + 2x \end{aligned}$$

$\xleftarrow{\text{same}} 100 = 8x - 12$

$$112 = 8x$$

$$\frac{112}{8} = \frac{8x}{8}$$

$$14 = x$$

width: $x = 14$

$$\begin{aligned} \text{length: } 3x-6 &= 3(14)-6 \\ &= 42-6 = 36 \end{aligned}$$

The length is 36 m and the width is 14 m.

Ex. One side of a triangle is 6 inches more than twice the shortest side. The third side is 9 inches more than the shortest side. The perimeter is 75 inches. Find all the sides.

One side: $2x + 6$

shortest side: x

3rd side: $x + 9$

$$(2x + 6) + x + (x + 9) = 75$$

$$4x + 15 = 75$$

$$4x = 60$$

$$\frac{4x}{4} = \frac{60}{4}$$

$$x = 15$$

shortest side: $x = 15$

One side: $2x + 6$

$$x = 15 \Rightarrow 2(15) + 6 = 30 + 6 = 36$$

3rd side: $x + 9$

$$x = 15 \Rightarrow 15 + 9 = 24$$

One side $\xrightarrow{\text{compare to}}$ shortest side
3rd side $\xrightarrow{\text{compare to}}$ ~~shortest side~~ x

The sides are
36 inches, 15 inches,
and 24 inches.