

# DO NOW

List the perimeter formulas for a:

triangle:

rectangle:

square:

## 2.1 Perimeter Word Problems

Follow the same steps as earlier word problems...

This time - in the set up, you will need to choose the appropriate formula to use.

$$P_{\square} = 2l + 2w$$

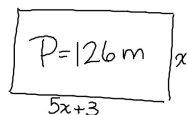
$$P_{\square} = 4s$$

$$P_{\triangle} = a + b + c$$

1. The length of a rectangle is 3 m more than 5 times the width. The perimeter is 126 m. Find the length and width.

$$\begin{aligned} \text{let } x &= \text{width} \\ 5x + 3 &= \text{length} \end{aligned}$$

$$\begin{aligned} 2l + 2w &= P \\ 2(5x + 3) + 2(x) &= 126 \\ 10x + 6 + 2x &= 126 \\ 10x + 2x &= 126 - 6 \\ 12x &= 120 \\ x &= \frac{120}{12} \\ x &= 10 \end{aligned}$$



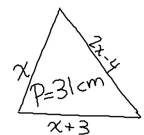
$$\begin{aligned} 5x + 3 \\ 5(10) + 3 \\ 50 + 3 \\ 53 \end{aligned}$$

$$\begin{aligned} \text{width} &= 10 \text{ m} \\ \text{length} &= 53 \text{ m} \end{aligned}$$

2. The first side of a triangle is 3 cm longer than the second side. The third side is 4 cm shorter than twice the length of the second side. If the perimeter is 31 cm, find the length of each side.

$$\begin{aligned} \text{let } x &= 2^{\text{nd}} \text{ side} \\ x + 3 &= 1^{\text{st}} \text{ side} \\ 2x - 4 &= 3^{\text{rd}} \text{ side} \end{aligned}$$

$$\begin{aligned} a + b + c &= P \\ x + (x + 3) + (2x - 4) &= 31 \\ x + x + 3 + 2x - 4 &= 31 \\ 4x - 1 &= 31 \\ 4x &= 31 + 1 \\ 4x &= 32 \\ x &= \frac{32}{4} \\ x &= 8 \end{aligned}$$

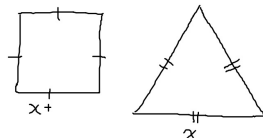


$$\begin{aligned} x + 3 &= 8 + 3 \\ &= 11 \\ 2x - 4 &= 2(8) - 4 \\ &= 16 - 4 \\ &= 12 \end{aligned}$$

$$\begin{aligned} 1^{\text{st}} \text{ side} &= 11 \text{ cm} \\ 2^{\text{nd}} \text{ side} &= 8 \text{ cm} \\ 3^{\text{rd}} \text{ side} &= 12 \text{ cm} \end{aligned}$$

3. A side of a square is 3 meters longer than the side of an equilateral triangle. The perimeter of the square is 2 times the perimeter of the triangle. Find the length of each side of the triangle.

$$\begin{aligned} \text{let } x &= \text{side of } \triangle \\ x + 3 &= \text{side of } \square \end{aligned}$$



$$\begin{aligned} \text{Translate: } P_{\square} &= 2(P_{\triangle}) \\ \text{Formulas: } 4s &= 2(a + b + c) \\ \text{Substitute: } 4(x + 3) &= 2(x + x + x) \\ 4x + 12 &= 2(3x) \\ 4x + 12 &= 6x \\ 12 &= 6x - 4x \\ 12 &= 2x \\ \frac{12}{2} &= x \\ 6 &= x \end{aligned}$$

$$\text{Side of } \triangle = 6 \text{ m}$$

# HOMEWORK

Worksheet - HW 2.1 Perimeter Problems