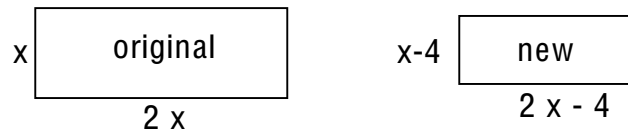


Solving Geometric Word Problems

1. Draw a sketch of the geometric figure(s).
2. Label the sides using information given in the problem.
3. Choose the correct formula (ex: area, perimeter) for the given problem.
4. Substitute the data from the problem into the formula.
5. Solve for the unknown.

Example 1: The length of a rectangle is twice the width. If the length and width are both decreased by 4 inches the resulting area is 44 square inches less than the original rectangle. Find the dimensions of the original rectangle.



$$\text{Area} = (\text{Length})(\text{Width})$$

$$\text{Area of the original rectangle} = \text{Area of the new rectangle} + 44$$

$$(2x)(x) = (2x-4)(x-4) + 44$$

$$2x^2 = 2x^2 - 8x - 4x + 16 + 44$$

$$0 = -12x + 60 \Rightarrow 12x = 60 \Rightarrow x = 5$$

The width of the original rectangle is **5 inches**. $x = 5$

The length of the original rectangle is **10 inches**. $2x \Rightarrow 2(5) = 10$

Example 2: The perimeter of a triangle is 60 meters. The length of one side is 6 meters less than twice the length of the shortest side. The length of another side is three times the length of the shortest side. What are the lengths of the three sides?

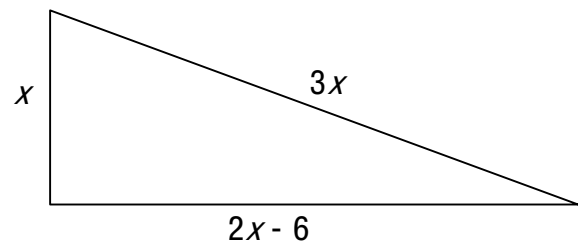
Let x = the length of the shortest side.

Perimeter of the triangle equals the sum of the three sides.

$$x + (2x - 6) + 3x = 60$$

$$x + 2x - 6 + 3x = 60$$

$$6x - 6 = 60 \Rightarrow 6x = 66 \Rightarrow x = 11$$



The length of the shortest side is **11 meters**. $x = 11$

The length of the middle side is **16 meters**. $2x - 6 \Rightarrow 2(11) - 6 = 16$

The length of the longest side is **33 meters**. $3x \Rightarrow 3(11) = 33$

Sample Problems:

1. If the sides of a square are increased by 5 ft. the area is increased by 65 ft^2 . What are the dimensions of the original square?
2. Mary's living room is $12' \times 20'$. She wants to buy a carpet that will leave an equal border on all sides. If the area of the border is to be $\frac{1}{3}$ the area of the carpet, how big a carpet should Mary buy? (Must use the quadratic equation on this problem)
3. Chuck's storage bin is 8ft longer than twice the length of Kim's storage bin. If the total length of their storage bins is 56ft and both bins are 10ft wide, find the areas of the two storage bins.

Answers: 1) $4' \times 4'$ 2) $18' \times 10'$ 3) Chuck's is 400 ft^2 , Kim's is 160 ft^2