

Conditions

Two triangles are similar. The lengths of the sides of the smaller triangle are 4,6,7. The longer side of the larger triangle is 21. What is the perimeter of the larger triangle?

Solution

We know if 2 triangles are similar, then their sides have an equal rate. It means, for example, for triangles ABC and DEF, which are similar:

$$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$$

That's why the longer side of known triangle (it's 7) is the side which is similar to the larger triangle's longer side (it's 21):

$$\frac{7}{21} = \frac{6}{?} = \frac{4}{?}$$

Now it's obvious to see, that as

$$\frac{7}{21} = \frac{1}{3}$$

Then

$$\frac{6}{?} = \frac{1}{3} = \frac{4}{?}$$

From here we see, that the unknown sides are 18 and 12. That's why the perimeter is **18+12+21=51**