

Similar Triangles

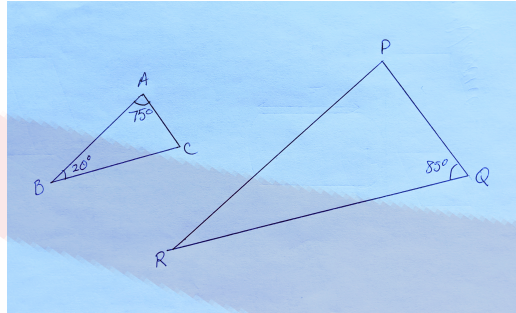
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2020

What are similar triangles?

Similar triangles are triangles with the same shape but are not exactly the same. The two similar triangles will have the same angles but different side lengths. In fact, the sides of similar triangles will be proportional. Let's consider an example.



Suppose triangles $\triangle ABC$ and $\triangle PRQ$ are similar. This means they have the same internal angles and the sides are proportional. In the case of the example above we have,

$$75^\circ = \angle A = \angle P$$

$$20^\circ = \angle B = \angle R$$

$$85^\circ = \angle C = \angle Q$$

Corresponding sides are also proportional in similar triangles.

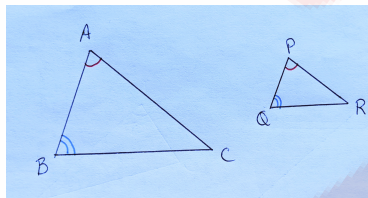
$$\frac{AB}{PR} = \frac{AC}{PQ} = \frac{BC}{RQ}$$

We denote similar triangles by,

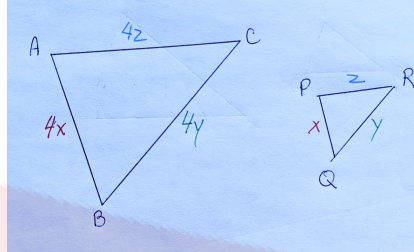
$$\triangle ABC \sim \triangle PRQ$$

Sufficient conditions for similar triangles

Angle - Angle (AA) similarity Two triangles are similar if two pairs of corresponding angles are equal.

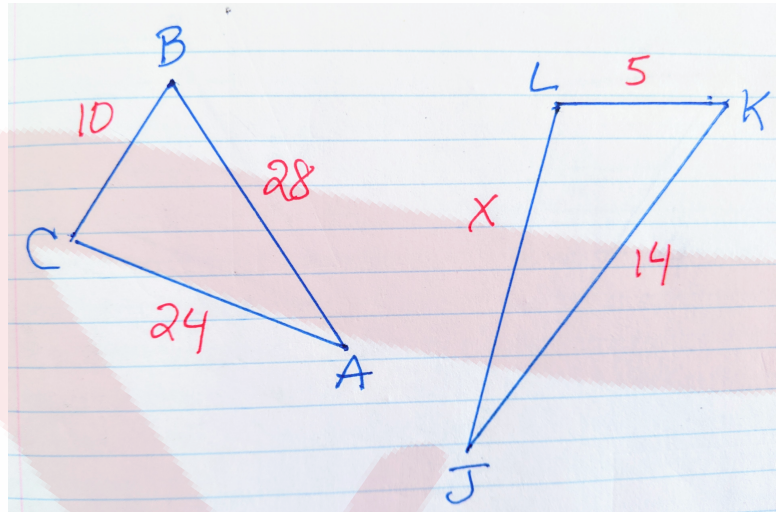


Side-Side-Side (SSS) similarity Two triangles are similar if the ratios of corresponding sides are equal.

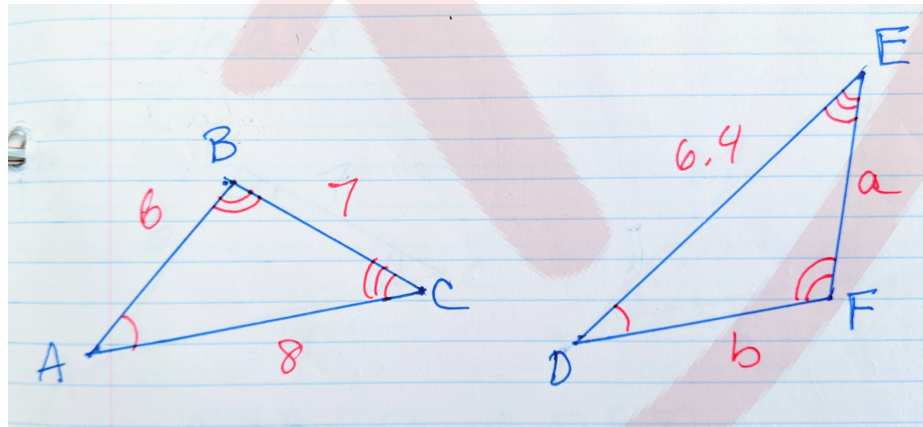


Exercises

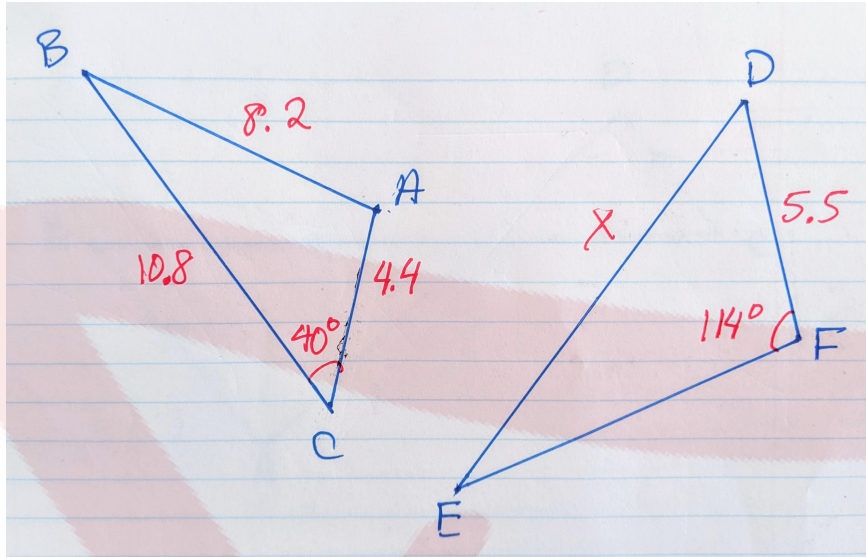
1. The triangles below are similar. $\triangle ABC \sim \triangle JKL$. Find x .



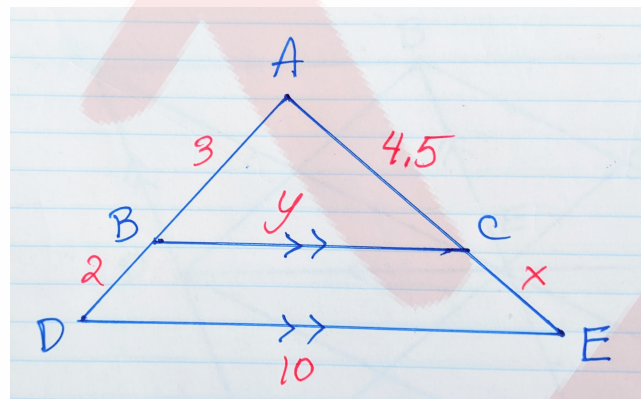
2. The triangles below are similar. $\triangle ABC \sim \triangle DFE$. Find a and b .



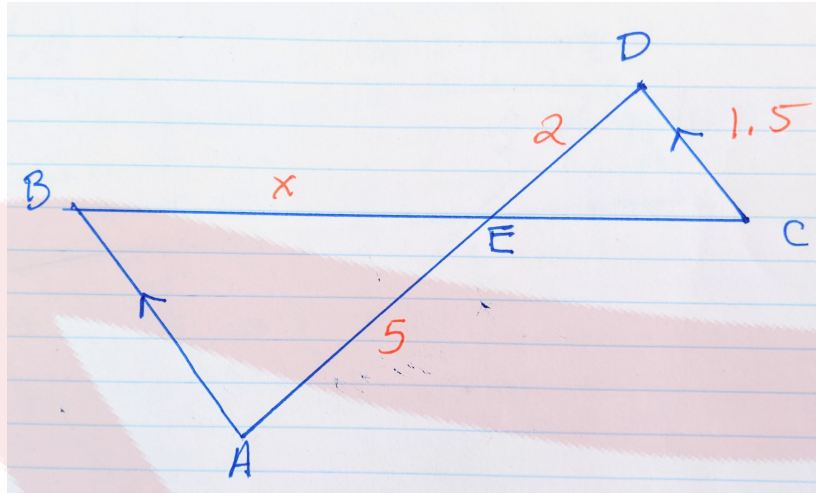
3. The triangles below are similar. $\triangle ABC \sim \triangle FED$. Find x .



4. Using the diagram below, find x and y .



5. Using the diagram below, find BE .



6. Using the diagram below, how many triangles are similar to $\triangle ABE$?

