

13 TAKS PREPARATION

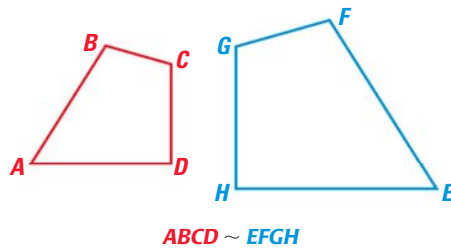


TAKS Obj. 8
TEKS G.11.A,
G.11.B, G.11.C

REVIEWING SIMILAR FIGURES AND SOLIDS

Two polygons are *similar polygons* if corresponding angles are congruent and corresponding side lengths are proportional.

In the diagram below, $ABCD$ is similar to $EFGH$. You can write “ $ABCD$ is similar to $EFGH$ ” as $ABCD \sim EFGH$.



Corresponding angles

$$\angle A \cong \angle E, \angle B \cong \angle F, \angle C \cong \angle G, \text{ and } \angle D \cong \angle H$$

Ratios of corresponding sides

$$\frac{AB}{EF} = \frac{BC}{FG} = \frac{CD}{GH} = \frac{DA}{HE}$$

If two polygons are triangles, you can use the results below to show similarity.

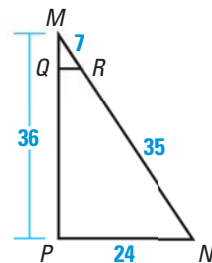
Angle-Angle Similarity Postulate: If two angles of one triangle are congruent to two angles of another triangle, then the two triangles are similar.

Side-Side-Side Similarity Theorem: If the lengths of the corresponding sides of two triangles are proportional, then the triangles are similar.

Side-Angle-Side Similarity Theorem: If an angle of one triangle is congruent to an angle of a second triangle and the lengths of the sides including these angles are proportional, then the triangles are similar.

EXAMPLE

$\triangle MNP$ is similar to $\triangle MRQ$. What is the perimeter of $\triangle MRQ$?



Solution

To determine the perimeter of $\triangle MRQ$, you first need to find RQ and QM .

Since $\triangle MNP \sim \triangle MRQ$, you know $\frac{MN}{MR} = \frac{NP}{RQ} = \frac{PM}{QM}$.

Find RQ and QM by writing and solving two proportions.

$$\frac{MN}{MR} = \frac{NP}{RQ} \quad \text{Write proportion.} \quad \frac{MN}{MR} = \frac{PM}{QM}$$

$$\frac{42}{7} = \frac{24}{RQ} \quad \text{Substitute.} \quad \frac{42}{7} = \frac{36}{QM}$$

$$RQ = 4 \quad \text{Solve the proportion.} \quad QM = 6$$

So, $MR + RQ + QM = 7 + 4 + 6 = 17$.

► The perimeter of $\triangle MRQ$ is 17 units.

AVOID ERRORS

When naming similar polygons, list letters for corresponding angles in the same order.

In the example, for instance, you could not write $\triangle MNP \sim \triangle QRM$ because $\angle M$ and $\angle Q$ are not corresponding angles.