

Similar Triangles, Proportions and Indirect Measurement

Grade 10 – Geometry math · Test · Standards: G-SRT.B.4, G-SRT.B.5

Name: _____ Date: _____ Class: _____

Eight questions, 20 points, 45 minutes. Write each proportion before solving and give the answer with units. Figures are not drawn to scale.

Standards: G-SRT.B.4, G-SRT.B.5 · **Level:** Grade 10 Geometry

Time: 45 minutes · 8 questions · Total: 20 points · Calculator: as allowed by your teacher

Question 1 Similar triangle ratios (2 points)

$\triangle PQR \sim \triangle XYZ$, with $PQ = 9$, $XY = 15$ and $QR = 12$. Find the scale factor from $\triangle PQR$ to $\triangle XYZ$ (1 point) and YZ (1 point).

Question 2 Choose the criterion (3 points)

Decide whether the two triangles are similar. If they are, name the criterion.

- Triangle 1 has angles 55° and 80° . Triangle 2 has angles 55° and 45° . (1 point)
- Triangle 1 has sides 4, 6 and 9. Triangle 2 has sides 6, 9 and 13.5. (1 point)
- Triangle 1 has sides 5 and 8 with a 40° angle between them. Triangle 2 has sides 10 and 12 with a 40° angle between them. (1 point)

Question 3 Side-splitter lengths (3 points)

$DE \parallel BC$ in $\triangle ABC$. $AD = 6$, $DB = 10$ and $AE = 9$.

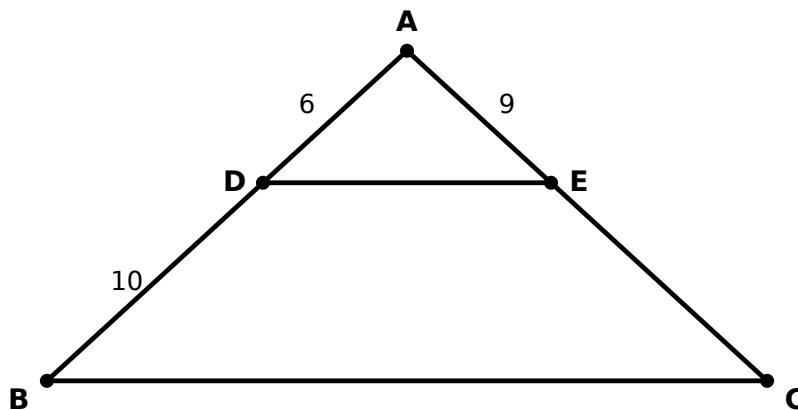


Figure for Question 3.

- Find EC . (1 point)
- Find AC . (1 point)
- If $BC = 32$, find DE . (1 point)

Question 4 Converse of the side-splitter theorem (2 points)

In $\triangle ABC$, D is on AB and E is on AC , with $AD = 4.5$, $DB = 6$, $AE = 6$ and $EC = 8$. Is DE parallel to BC ? Show your work.

Question 5 Altitude to the hypotenuse (3 points)

A right triangle has legs 9 and 12 and hypotenuse 15. The altitude to the hypotenuse is drawn.

- Find the altitude using area. (1 point)
- Find the two pieces of the hypotenuse. (1 point)
- Verify that the altitude squared equals the product of the pieces. (1 point)

Question 6 Prove similar triangles (3 points)

Given: $AB \parallel DE$, and segments AD and BE intersect at C . Prove: $\triangle ABC \sim \triangle DEC$.

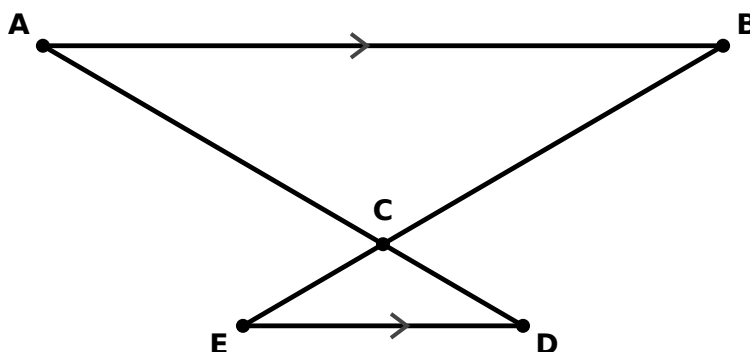


Figure for Question 6.

Question 7 Mirror measurement (2 points)

A person with eye height 1.5 meters stands 3 meters from a mirror on the ground. The mirror is 40 meters from a tower. Write the proportion for the tower height h (1 point) and find h (1 point).

Question 8 Parallel lines and transversals (2 points)

Three parallel roads are cut by two straight paths. On the first path the segments are 80 meters and 120 meters. On the second path the first segment is 70 meters. Find the second segment on the second path.