

Geometry · Similar Triangles and Proportions · Test Answer Key

Common Core G-SRT.B.4, G-SRT.B.5 · mathovore.fr

Use this key to score the similar triangles test out of 20 points. Each solution shows the proportion or reason expected, and the scoring note explains how partial credit is given.

GeometryCommon Core: G-SRT.B.4 · G-SRT.B.5

Question 1: Similarity by SAS (2 points)

- a. $\frac{DE}{AB} = \frac{12}{8} = \frac{3}{2}$ and $\frac{DF}{AC} = \frac{18}{12} = \frac{3}{2}$, and the included angles are congruent (65°). The triangles are similar by SAS.
- b. $ABC \sim DEF$ with scale factor $\frac{3}{2}$.

Similar by SAS; $ABC \sim DEF$; $k = 3/2$.

Scoring: 1 point for both ratios and the criterion SAS; 1 point for a correctly ordered statement and $k = 3/2$.

Question 2: Similar by SSS (2 points)

- a. $\frac{12}{9} = \frac{16}{12} = \frac{20}{15} = \frac{4}{3}$: similar by SSS.
- b. $\frac{10}{5} = 2$, $\frac{12}{6} = 2$, $\frac{15}{7} \approx 2.14$: the ratios are not all equal, so not similar.

(a) similar, ratio 4/3; (b) not similar.

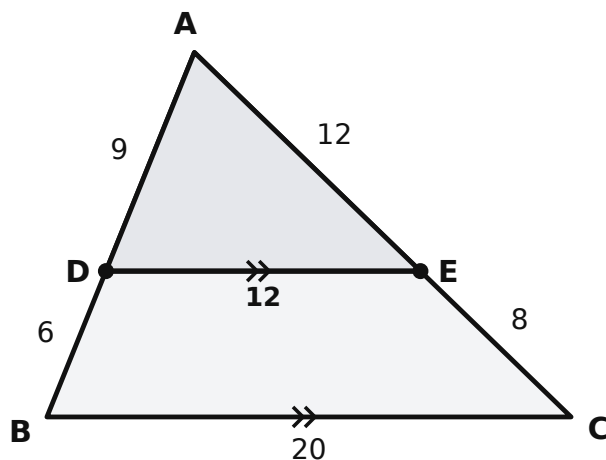
Scoring: 1 point for each correct decision supported by all three ratios.

Question 3: Triangle proportionality (3 points)

- a. $\frac{9}{6} = \frac{12}{y}$, so $9y = 72$ and $y = 8$.
- b. $AB = 15$, so $\frac{AD}{AB} = \frac{9}{15} = \frac{3}{5} = \frac{DE}{20}$ and $DE = 12$.
- c. Angle A is shared and $\angle ADE \cong \angle ABC$ (corresponding angles), so AA.

EC = 8; DE = 12; AA.

Scoring: 1 point for $EC = 8$; 1 point for $DE = 12$ using the ratio of whole sides; 1 point for AA with a reason.



EC = 8 and DE = 12.

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

- $\frac{6}{10} = \frac{3}{5}$ and $\frac{9}{15} = \frac{3}{5}$: parallel by the converse.
- $\frac{6}{7} \approx 0.714$ and $\frac{8}{11} \approx 0.727$: not equal, so not parallel.

(a) parallel; (b) not parallel.

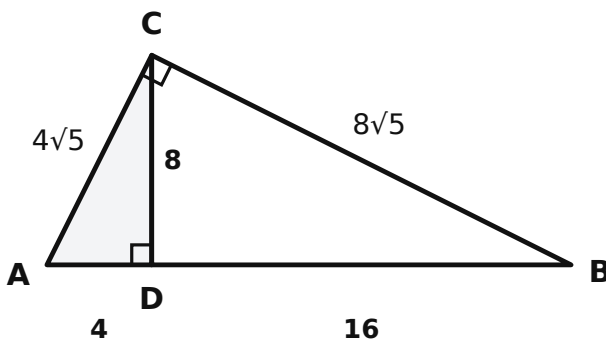
Scoring: 1 point for each correct conclusion with both ratios shown.

Question 5: Right triangle altitude (3 points)

- $CD^2 = 4 \cdot 16 = 64$, so $CD = 8$.
- $AB = 20$ and $AC^2 = AD \cdot AB = 4 \cdot 20 = 80$, so $AC = \sqrt{80} = 4\sqrt{5}$.
- $BC^2 = DB \cdot AB = 16 \cdot 20 = 320$, so $BC = \sqrt{320} = 8\sqrt{5}$.

Check: $80 + 320 = 400 = 20^2$. **CD = 8, AC = $4\sqrt{5}$, BC = $8\sqrt{5}$.**

Scoring: 1 point for each length, with the correct geometric mean setup.



All lengths found.

Question 6: Complete a similarity proof (3 points)

Statements	Reasons
$AB \parallel DE$	Given
$\angle BAC \cong \angle DEC$	Alternate interior angles are congruent (transversal AE)
$\angle ACB \cong \angle ECD$	Vertical angles are congruent
Triangle ABC is similar to triangle EDC	AA similarity

Scoring: 1 point for each correct reason in steps 2, 3 and 4.

Question 7: Indirect measurement (2 points)

- a. $\frac{h}{36} = \frac{6}{8}$
b. $8h = 216$, so $h = 27$.

The flagpole is 27 feet tall.

Scoring: 1 point for a correct proportion with matching quantities; 1 point for $h = 27$ ft.

Question 8: Similar triangles and algebra (2 points)

$\frac{PQ}{ST} = \frac{QR}{TU}$; $\frac{x+2}{10} = \frac{9}{15}$. Cross-multiply: $15(x+2) = 90$, so $x+2 = 6$ and $x = 4$.

$PQ = 4+2 = 6$. **$x = 4$ and $PQ = 6$.**

Scoring: 1 point for the correct proportion; 1 point for $x = 4$ and $PQ = 6$.

Question 9: Geometric mean (1 point)

$\sqrt{5 \cdot 20} = \sqrt{100} = 10$. **10**

Scoring: 1 point for 10.

Total
20 points