

Geometry · Congruent Triangles: SSS, SAS, ASA, AAS and HL · Test

Common Core G-CO.B.6, G-CO.B.7, G-CO.B.8, G-SRT.B.5 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

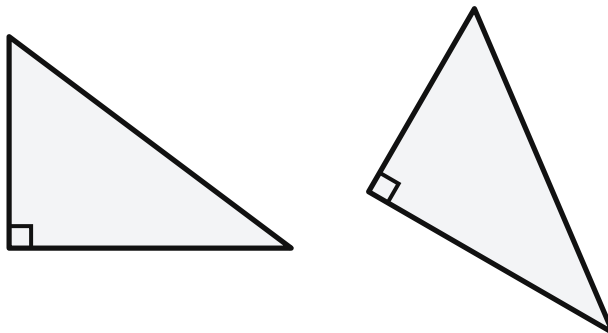
This 45-minute test has 9 questions worth 20 points. Show your work, mark the diagrams, and name every reason in your proofs. Calculators are allowed for square roots, but all answers should be exact or labeled with units.

Test information

- **Grade:** Geometry
- **Chapter:** Congruent Triangles: SSS, SAS, ASA, AAS and HL
- **Common Core:** G-CO.B.6, G-CO.B.7, G-CO.B.8, G-SRT.B.5
- **Time:** 45 minutes
- **Total:** 20 points (Question 1: 2 pts; Question 2: 2 pts; Question 3: 2 pts; Question 4: 2 pts; Question 5: 2 pts; Question 6: 3 pts; Question 7: 2 pts; Question 8: 2 pts; Question 9: 3 pts)

Question 1: Corresponding parts (2 points)

$\triangle JKL \cong \triangle PQR$ as shown, with a right angle at K.



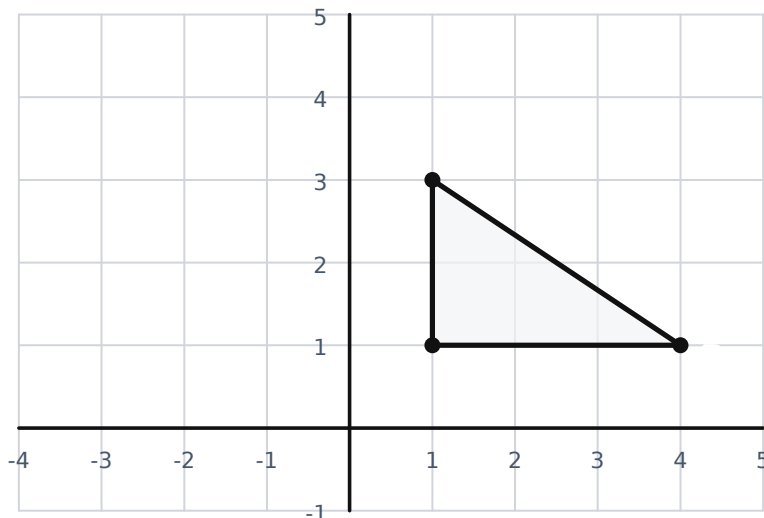
Triangles JKL and PQR.

a. Find PR . (1 point)

- b. Find $m\angle Q$. (1 point)

Question 2: Rotation on the plane (2 points)

Triangle ABC is rotated 90° counterclockwise about the origin, which sends (x,y) to $(-y,x)$.



Triangle ABC.

- Write the coordinates of A' , B' , and C' . (1 point)
- Find BC and $B'C'$, and state why $\triangle ABC \cong \triangle A'B'C'$. (1 point)

Question 3: Choose the criterion (2 points)

In each case, name the criterion that proves $\triangle ABC \cong \triangle DEF$, or write *not enough information*.

- $AB = DE = 7$, $BC = EF = 10$, and $\angle B \cong \angle E$. (1 point)
- $AB = DE$, $AC = DF$, and $\angle B \cong \angle E$, where B and E are not between the given sides. (1 point)

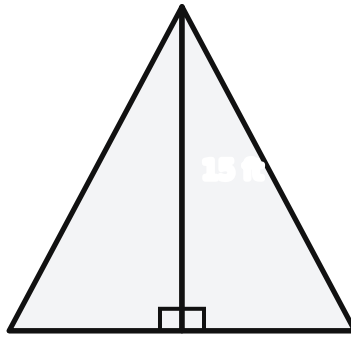
Question 4: Solve with congruent parts (2 points)

$\triangle ABC \cong \triangle DEF$, $AB = (4x - 5)$ cm, $DE = (2x + 9)$ cm, $m\angle C = (6y + 2)^\circ$, and $m\angle F = (8y - 18)^\circ$.

- Find x and AB . (1 point)
- Find y and $m\angle C$. (1 point)

Question 5: Right triangles and HL (2 points)

In the figure, $\overline{BD} \perp \overline{AC}$, $AB = BC = 17$ ft, and $BD = 15$ ft.

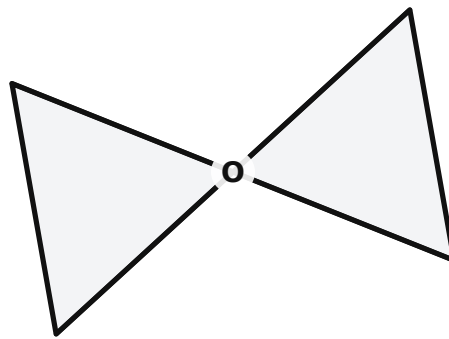


Isosceles triangle ABC with BD perpendicular to AC.

- Find AD . (1 point)
- Name the criterion that proves $\triangle ABD \cong \triangle CBD$ and state DC . (1 point)

Question 6: Two-column proof (3 points)

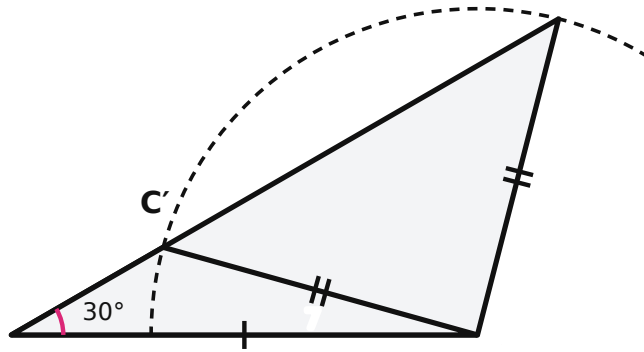
Given: O is the midpoint of both $\overline{PQ}$ and $\overline{RS}$. Prove $\triangle POR \cong \triangle QOS$. Write a two-column proof.



Segments PQ and RS cross at O.

Question 7: Two sides and an angle (2 points)

Triangles ABC and ABC' share $\angle A = 30^\circ$ and $AB = 10$ in, and $BC = BC' = 7$ in. Measuring gives AC of about 13.6 in and AC' of about 3.8 in.

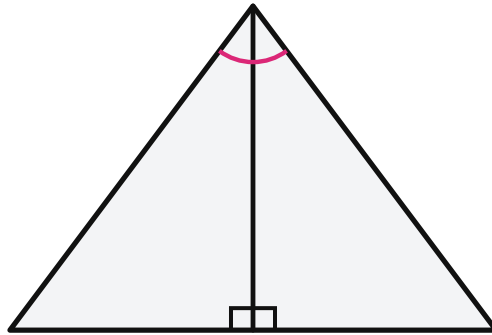


Triangles ABC and ABC'.

- List the three pairs of congruent parts the triangles share. (1 point)
- Are the triangles congruent? Explain. (1 point)

Question 8: Bisector and CPCTC (2 points)

In the figure, $\overline{BD}$ bisects $\angle ABC$ and $\overline{BD} \perp \overline{AC}$. Also $AB = (2x+1)$ in and $CB = (3x-5)$ in.

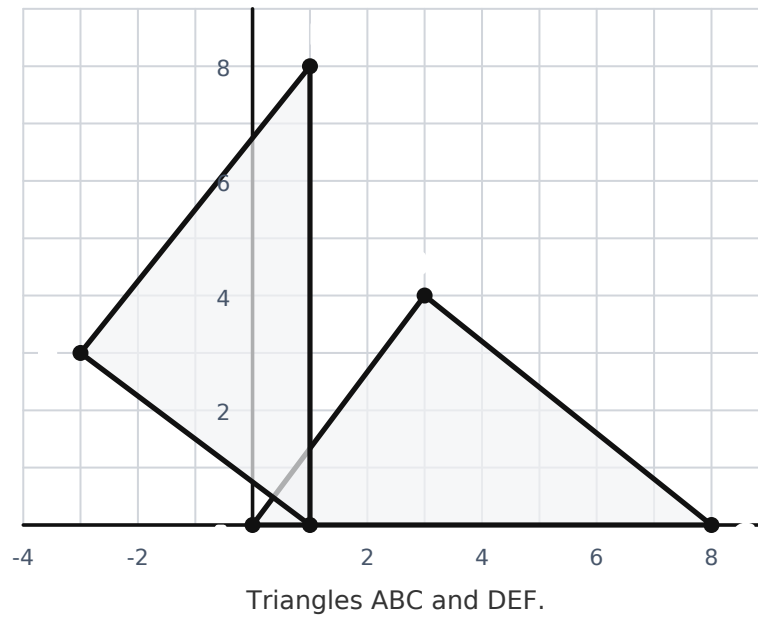


BD bisects angle ABC and meets AC at right angles.

- Name the criterion that proves $\triangle ABD \cong \triangle CBD$. (1 point)
- Find x and AB . (1 point)

Question 9: Congruence on the plane (3 points)

$\triangle ABC$ has $A(0,0)$, $B(3,4)$, and $C(8,0)$. $\triangle DEF$ has $D(1,0)$, $E(-3,3)$, and $F(1,8)$.



- a. Find the lengths of all three sides of each triangle. (2 points)
- b. Prove $\triangle ABC \cong \triangle DEF$ and name the criterion. (1 point)