

Match It Up

Use lengths, angles and correspondence to test congruence

GRADE 6 • 6.MG.4.c

6.MG.4.c "Determine the congruence of segments, angles, and polygons given their properties."

NAME _____

DATE _____

BUILD UNDERSTANDING

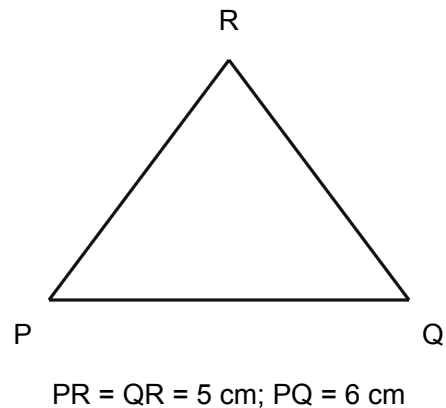
Congruent segments have equal lengths; congruent angles have equal openings. Congruent polygons have matching corresponding sides and angles. Sliding, turning or flipping preserves congruence. Use the stated measures; these drawings are not at actual centimeter size.

WORKED EXAMPLE

Which sides of triangle PQR are congruent?

1. Compare the explicitly stated side lengths.
2. Match the two equal legs, not the unequal base.

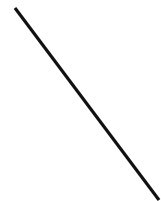
Answer: PR and QR: each is 5 cm. The base PQ is 6 cm.



PRACTICE 4 problems

- 1** Which segment is congruent to AB: CD, EF, both or neither? Justify using the lengths.

AB: 6 cm

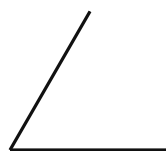


CD: 6 cm



EF: 7 cm

- 2** Are angles J and K congruent? Explain whether ray length and direction affect your decision.

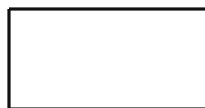


J: 60 degrees

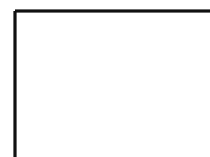


K: 60 degrees

- 3** Are rectangles A and B congruent? Identify the property that settles your answer.



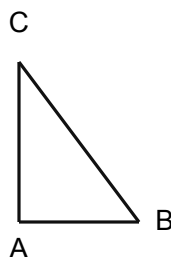
A: 4 by 2 cm



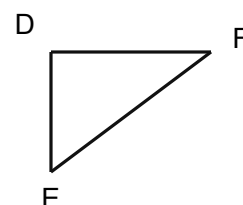
B: 4 by 3 cm

All angles: 90 degrees

- 4** Match the vertices of triangle ABC to triangle DEF. State whether the triangles are congruent and justify.



AB=3, AC=4, BC=5 cm



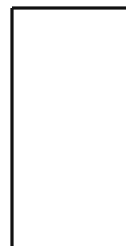
DE=3, DF=4, EF=5 cm

APPLY IT Show your work

- 1** A designer turns frame B to compare it with frame A. Are the frames congruent? Explain using sides and angles.

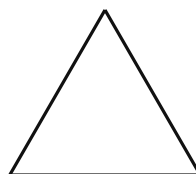


Frame A: 6 by 3 cm



Frame B: 3 by 6 cm

- 2** The two triangular club patches are equilateral. Are they congruent? Explain why matching angles alone are insufficient.



P: all sides 5 cm



Q: all sides 6 cm

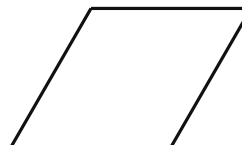
Both are equilateral triangles

CHALLENGE One step up

Mina claims the square and rhombus are congruent because all sides are 4 cm. Evaluate her reasoning using both side lengths and angles.



Square: all sides 4 cm
All angles 90 degrees



Rhombus: all sides 4 cm
Angles 60, 120, 60, 120

Require evidence from the given properties, not appearance alone. Accept equivalent vertex correspondences for the matching triangles only when every corresponding side is preserved. All geometric shapes are drawn to consistent proportions.

PRACTICE 1

CD only: $AB = CD = 6$ cm, while $EF = 7$ cm. Direction does not affect length.

PRACTICE 2

Yes. Both openings measure 60 degrees; ray lengths and directions do not change angle measure.

PRACTICE 3

No. Their corresponding shorter sides differ: 2 cm versus 3 cm.

PRACTICE 4

A matches D, B matches E and C matches F. $AB = DE = 3$ cm, $AC = DF = 4$ cm and $BC = EF = 5$ cm; the triangles are congruent.

APPLY IT 1

Yes. Both rectangles have sides 6, 3, 6, 3 cm and four right angles.

Turn frame B a quarter-turn. Its 6 cm sides match the 6 cm sides of A, its 3 cm sides match the 3 cm sides of A, and all angles match.

APPLY IT 2

No. Both have 60-degree angles, but every side of Q is 6 cm and every side of P is 5 cm.

All angles match because both triangles are equilateral. Corresponding side lengths fail to match, so one patch is larger.

CHALLENGE

Mina is incorrect. Equal sides are not enough: 90-degree square angles cannot match the 60- and 120-degree rhombus angles.