LESSON MAKER PRO

Triangle Match Moves

Use matching parts and rigid motions to prove congruence.

HIGH SCHOOL · MT.CORE.GEOM.TRANS.2.b

MT.CORE.GEOM.TRANS.2.b "Define the congruence of two and show that two figures are congruent by finding a sequence of rigid motions that maps one figure to the other by: Verifying that two triangles are congruent if, but not only if..."

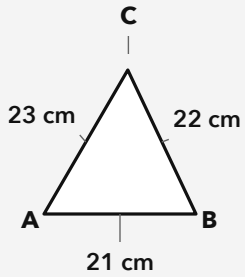
NAME _____ DATE _____

HOW TO MATCH TRIANGLES

Triangles are congruent when a sequence of translations, rotations, and reflections can line them up exactly. ASA, SAS, and SSS each give enough matching parts to show that this is possible.

WORKED EXAMPLE

Compare the shown triangle with triangle DEF, where DE = 21 cm, EF = 22 cm, and FD = 23 cm. Name the congruence test and describe how to align the triangles.



1. AB matches DE, BC matches EF, and CA matches FD.
2. Three matching side pairs give SSS.
3. Move A to D, rotate AB onto DE, then reflect across DE if needed.

Answer: SSS; triangle ABC is congruent to triangle DEF.

PRACTICE 4 problems

1 AB = DE = 10, BC = EF = 11, and AC = DF = 12. Which test proves triangle ABC congruent to triangle DEF?

ANSWER _____

2 AB = DE = 10, angle B = angle E = 80°, and BC = EF = 13. Which test proves congruence?

ANSWER _____

3 Angle A = angle D = 50°, AB = DE = 12, and angle B = angle E = 70°. Which test proves congruence?

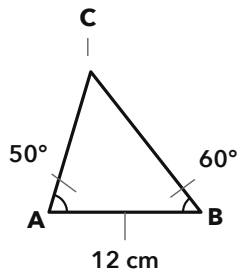
ANSWER _____

4 AB = DE = 11, AC = DF = 13, BC = x + 10, and EF = 16. What must x be for SSS to prove congruence?

ANSWER _____

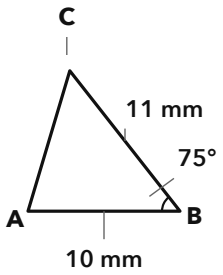
APPLY IT Show your work

1 A skate shop cuts the shown decal. A second decal, DEF, has angle D = 50°, angle E = 60°, and DE = 12 cm. Are the decals congruent? Name the test and describe how to align them.



ANSWER _____

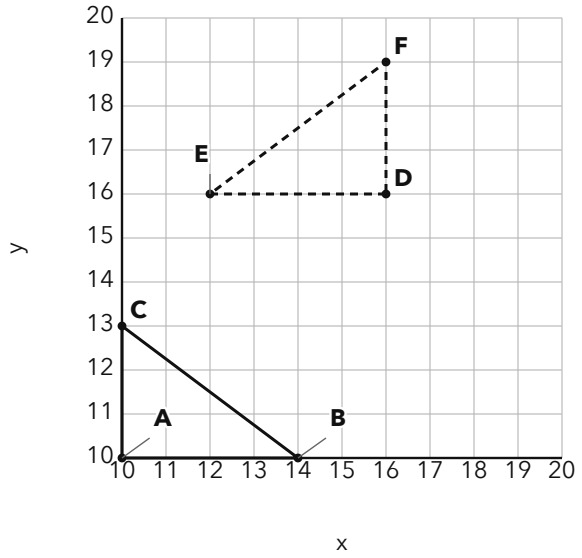
2 A game designer copies the shown icon. Copy DEF has DE = 10 mm, EF = 11 mm, and angle E = 75°. Is the copy congruent? Name the test and describe how to align it.



ANSWER _____

CHALLENGE One step up

Give two rigid motions, in order, that map triangle ABC to triangle DEF. Verify congruence with a test using the coordinates.



WORK SPACE AND ANSWER

ANSWER KEY

Triangle Match Moves

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	AB = DE = 10, BC = EF = 11, and AC = DF = 12. Which test proves triangle ABC congruent to triangle DEF?	**SSS**
2	AB = DE = 10, angle B = angle E = 80°, and BC = EF = 13. Which test proves congruence?	**SAS**
3	Angle A = angle D = 50°, AB = DE = 12, and angle B = angle E = 70°. Which test proves congruence?	**ASA**
4	AB = DE = 11, AC = DF = 13, BC = x + 10, and EF = 16. What must x be for SSS to prove congruence?	**x = 6**

PART 2 · APPLY IT

1. **Yes, by ASA. Move A to D, rotate AB onto DE, then reflect across DE if needed.** The marked side lies between the two marked angles in each triangle. After AB aligns with DE, a reflection if needed places C on F.
2. **Yes, by SAS. Move B to E, rotate BA onto ED, then reflect across ED if needed.** The 75° angle lies between the two marked sides in each triangle. Aligning those parts places the third vertices together.

CHALLENGE

Reflect across x = 13, then translate 6 units up. AB = DE = 4, AC = DF = 3, and BC = EF = 5, so SSS verifies congruence.

Accept another correct sequence of rigid motions in the challenge. In the word problems, accept any alignment that maps A to D, B to E, and C to F.