LESSON MAKER PRO

Rigid Motion Match

Show triangle congruence by matching every part.

HIGH SCHOOL · HSG-CO.B.7

CCSS.Math.Content.HSG-CO.B.7 "Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent."

NAME _____ DATE _____

THE BIG IDEA

Two triangles are congruent exactly when a rigid motion can place one on the other. Rigid motions preserve side lengths and angle measures, so all three corresponding sides and all three corresponding angles must match.

WORKED EXAMPLE

Triangle UVW and triangle RST each have three sides of length 11 and three angles of 60 degrees. Are they congruent?

1. Each triangle has three equal sides of length 11.
2. Each triangle has three equal angles of 60 degrees.
3. A rigid motion can line up U, V, W with R, S, T.

Answer: Yes, triangle UVW is congruent to triangle RST.

PRACTICE 5 problems

1 AB=JK=10, BC=KL=5, and AC=JL=5sqrt3. Write a congruence statement.

ANSWER _____

2 Triangle RST is congruent to triangle UVW. RS=2x+1 and UV=17. Find x.

ANSWER _____

3 Triangle MNO is congruent to triangle QPR. Angle N=3x+4 and angle P=49 degrees. Find x.

ANSWER _____

4 Triangle GHI has GH=12, HI=14, and GI=16. Triangle CDE has CD=14, DE=16, and CE=12. Write a congruence statement.

ANSWER _____

5 Triangle LMP has LM=21, MP=24, and LP=27. Triangle XYZ has XY=21, YZ=24, and XZ=29. Are the triangles congruent? Why?

ANSWER _____

APPLY IT Show your work

1 A robotics team cuts two triangular braces. Brace DFG has DF=33, FG=35, and DG=40. Brace HJK has HJ=40, JK=33, and HK=35. Are the braces congruent? Write a congruence statement.

WORK SPACE

ANSWER _____

2 At an esports event, two triangular sponsor signs are checked for the same cut template. Sign PQR has PQ=41, QR=43, and PR=45. Sign XYZ has XY=41, YZ=43, and XZ=47. Can the signs be congruent?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A rigid motion maps triangle ABC onto triangle DEF, with A mapping to D, B mapping to E, and C mapping to F. Explain why all corresponding sides and angles are congruent.

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ANSWER KEY

Rigid Motion Match

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	AB=JK=10, BC=KL=5, and AC=JL=5sqrt3. Write a congruence statement.	**Triangle ABC is congruent to triangle JKL.**
2	Triangle RST is congruent to triangle UVW. RS=2x+1 and UV=17. Find x.	**x=8**
3	Triangle MNO is congruent to triangle QPR. Angle N=3x+4 and angle P=49 degrees. Find x.	**x=15**
4	Triangle GHI has GH=12, HI=14, and GI=16. Triangle CDE has CD=14, DE=16, and CE=12. Write a congruence statement.	**Triangle GHI is congruent to triangle ECD.**
5	Triangle LMP has LM=21, MP=24, and LP=27. Triangle XYZ has XY=21, YZ=24, and XZ=29. Are the triangles congruent? Why?	**No. A corresponding side pair differs: LP=27 and XZ=29.**

PART 2 · APPLY IT

1. **Yes, triangle DFG is congruent to triangle JKH.** Match DF with JK, FG with KH, and DG with JH. All three corresponding sides match.
2. **No, the signs cannot be congruent.** PQ matches XY and QR matches YZ, but PR=45 does not equal XZ=47.

CHALLENGE

Rigid motions preserve distance and angle measure. Therefore AB=DE, BC=EF, AC=DF, angle A=angle D, angle B=angle E, and angle C=angle F.

Accept any equivalent congruence statement with the same vertex correspondence. Accept explanations that cite matching corresponding measures or preservation of length and angle measure under rigid motions.