

Congruent Triangles - Practice Worksheet

Name: _____ Date: _____

Instructions: For each problem, state which congruence postulate (SSS, SAS, ASA, AAS, or HL) proves the triangles congruent, or write 'Not enough information' if no postulate applies. Show your reasoning where asked.

1. Triangle ABC and Triangle DEF each have sides of length 5, 7, and 9. Which postulate proves them congruent?

2. In triangles PQR and XYZ: $PQ = XY$, angle $P = \text{angle } X$, $PR = XZ$. Which postulate applies?

3. In triangles ABC and DEF: angle $A = \text{angle } D$, angle $B = \text{angle } E$, $AB = DE$. Which postulate applies?

4. In triangles MNO and RST: angle $M = \text{angle } R$, angle $N = \text{angle } S$, $NO = ST$. Which postulate applies?

5. Triangles ABC and DEF are right triangles. Hypotenuse $AB = DE$ and leg $BC = EF$. Which postulate applies?

6. Two triangles share side AC. $AB = DC$ and $BC = AC$ (the shared side). Angle $B = \text{angle } D = 90$ degrees. Which postulate proves congruence?

7. In triangles JKL and PQR: $JK = PQ = 6$, $KL = QR = 8$, angle $K = \text{angle } Q = 55$ degrees. Which postulate applies?

8. Triangles ABC and DEF: angle $A = \text{angle } D = 40$ degrees, angle $C = \text{angle } F = 70$ degrees, and $BC = EF$. Which postulate applies?

9. Given: Triangle ABC with $AB = 10$, $BC = 14$, $AC = 10$. Triangle DEF with $DE = 10$, $EF = 10$, $DF = 14$. Are the triangles congruent? If yes, state the postulate.

10. Write a two-column proof: Given that M is the midpoint of both AC and BD (diagonals of quadrilateral ABCD), prove that triangle AMB is congruent to triangle CMD.

Answer Key

1. SSS
2. SAS
3. ASA
4. AAS

5. HL

6. HL

7. SAS

8. AAS

9. Yes, SSS (all three pairs of sides are equal)

10. Statements: 1) M is midpoint of AC and BD (Given). 2) $AM = MC$, $BM = MD$ (Definition of midpoint). 3) $\angle AMB = \angle CMD$ (Vertical angles). Reason for congruence: SAS