



1 Here are the side lengths of four triangles.

Triangle A: 5 cm, 7 cm, 9 cm

Triangle B: 5 cm, 7 cm, 8 cm

Triangle C: 9 cm, 7 cm, 5 cm

Triangle D: 5 cm, 6 cm, 9 cm

Write down the letters of the two triangles that are congruent to each other.

(1 mark)

Congruent triangles have the same shape and size. SSS (side-side-side) says that three matching side lengths are enough to establish this, even if one triangle is rotated or reflected

Triangle A has sides 5 cm, 7 cm and 9 cm. Triangle C has sides 9 cm, 7 cm and 5 cm, which is the same set of three lengths

Triangle B (5, 7, 8) and Triangle D (5, 6, 9) each differ from this set, so the congruent pair is A and C

A and C

2 In triangles PQR and XYZ,

$PQ = XY = 6$ cm

angle $PQR = \text{angle } XYZ = 40^\circ$

$QR = YZ = 8$ cm

The two triangles are congruent.

Write down the congruence condition that shows the triangles are congruent.

(1 mark)

Two pairs of sides are equal

$PQ = XY$ and $QR = YZ$

The equal angles, angle PQR and angle XYZ , are between these pairs of sides at Q and at Y , so the angle is the included angle in each triangle

Two sides and the included angle match, so the condition is SAS

SAS

3

Triangle ABC has $AB = 5$ cm, $BC = 7$ cm and $AC = 9$ cm.

Triangle PQR has $PQ = 5$ cm, $QR = 7$ cm and $PR = 9$ cm.

Are the two triangles congruent? Give a reason for your answer.

(2 marks)

$$AB = PQ = 5 \text{ cm}$$

$$BC = QR = 7 \text{ cm}$$

$$AC = PR = 9 \text{ cm}$$

all three sides match: SSS

Yes, congruent (SSS)

4

Here are the measurements of four rectangles.

- Rectangle A: 6 cm by 4 cm
- Rectangle B: 4 cm by 6 cm (turned through a right angle)
- Rectangle C: 6 cm by 5 cm
- Rectangle D: 5 cm by 6 cm

Write down the two pairs of rectangles that are congruent.

(2 marks)

A: 6 by 4

B: 4 by 6 = 6 by 4

C: 6 by 5

D: 5 by 6 = 6 by 5

turning a shape does not change its size

A and B; C and D

5

Triangles ABC and PQR are congruent. A matches P, B matches Q and C matches R.

AB = 7 cm, BC = 9 cm, PR = 11 cm and angle ABC = 64° .

- Write down the length of QR.
- Write down the length of AC.
- Write down the size of angle PQR.

(3 marks)

$A=P, B=Q, C=R$

a)

QR matches BC

$$QR = 9 \text{ cm}$$

b)

AC matches PR

$$AC = 11 \text{ cm}$$

c)

angle PQR matches angle ABC

$$64^\circ$$

6

For each pair of triangles, write down the condition (SSS, SAS, ASA, RHS) that shows they are congruent, or write "not enough information".

- Both triangles have sides of 6 cm and 8 cm with an angle of 50° between them.
- Both triangles have a side of 7 cm with an angle of 40° at one end and an angle of 60° at the other end.
- Both triangles have a right angle, a hypotenuse of 13 cm and one other side of 5 cm.
- Both triangles have angles of 50° , 60° and 70° .

(4 marks)

a)

two sides + angle between them

SAS

b)

two angles + side between them

ASA

c)

right angle, hypotenuse, one side

RHS

d)

angles only: size could be different

not enough information

7

In triangle ABC, $AB = 8$ cm, $BC = 6$ cm and angle $BAC = 40^\circ$.

In triangle DEF, $DE = 8$ cm, $EF = 6$ cm and angle $EDF = 40^\circ$.

Ahmed says "The triangles are congruent because two sides and an angle are equal (SAS)."

Explain why Ahmed may not be correct.

(2 marks)

SAS needs the angle BETWEEN the two sides

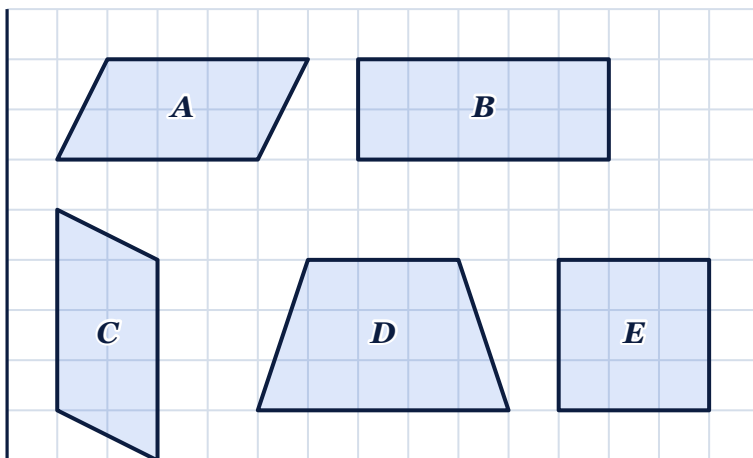
between AB and BC is angle B, not angle A

angle is not the included angle, so not SAS

8

The diagram shows five quadrilaterals, labelled A, B, C, D and E, drawn on a centimetre grid.

- Write down the letters of the pair of congruent quadrilaterals.
- Write down the mathematical name of quadrilateral A.



(2 marks)

Congruent shapes are exactly the same shape and size. A and C are identical parallelograms, one rotated, so A and C are the congruent pair
 Quadrilateral A has two pairs of parallel sides with no right angles, so it is a parallelogram

9

ABCD is a quadrilateral with $AB = CD$ and $BC = DA$. The diagonal AC is drawn.

Prove that triangle ABC is congruent to triangle CDA.

(3 marks)

$$AB = CD \text{ (given)}$$

$$BC = DA \text{ (given)}$$

$$AC = CA \text{ (common side)}$$

Congruent (SSS)

10

The straight lines AB and CD cross at P. P is the midpoint of AB and P is the midpoint of CD.

Prove that triangle APC is congruent to triangle BPD.

(3 marks)

$$AP = PB \text{ (P is midpoint of AB)}$$

$$CP = PD \text{ (P is midpoint of CD)}$$

$$\text{angle APC} = \text{angle BPD} \text{ (vertically opposite)}$$

Congruent (SAS)

11

A and B are points on a circle with centre O. M is the midpoint of the chord AB. OA, OB and OM are drawn.

Prove that triangle OAM is congruent to triangle OBM.

(3 marks)

$OA = OB$ (radii of the same circle)

$AM = MB$ (M is midpoint of AB)

$OM = OM$ (common side)

Congruent (SSS)