

Congruent Triangles and Geometric Proof

For AQA GCSE Mathematics (8300) • Higher tier

Name _____

Total marks: **24**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method. Diagrams are not drawn accurately.

- 1** Two triangles have the same three angles.

Kit says,

‘The two triangles must be congruent.’

Is Kit correct? Tick a box.

Give a reason for your answer.

[1 mark]

☐ Yes

☐ No

- 2** In triangle PQR and triangle XYZ

$$PQ = XY = 7 \text{ cm} \quad QR = YZ = 11 \text{ cm} \quad \text{angle } PQR = \text{angle } XYZ = 48^\circ$$

Circle the condition that shows these triangles are congruent.

[1 mark]

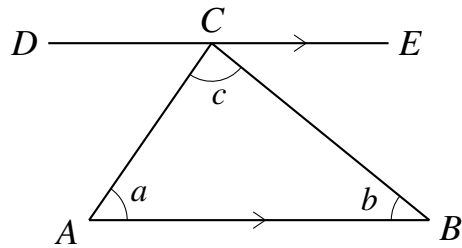
SSS

SAS

ASA

RHS

3 ABC is a triangle.



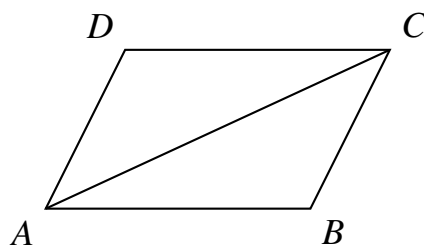
Not drawn accurately

DCE is a straight line parallel to AB .

Prove that $a + b + c = 180^\circ$

[3 marks]

- 4 Here is a parallelogram.



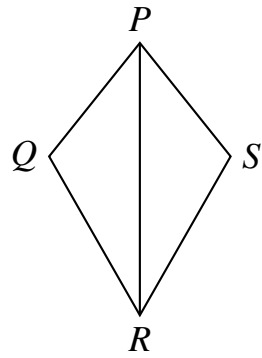
Not drawn accurately

$ABCD$ is a parallelogram.

Prove that triangles ABC and CDA are congruent.

[3 marks]

5 Here is a kite.

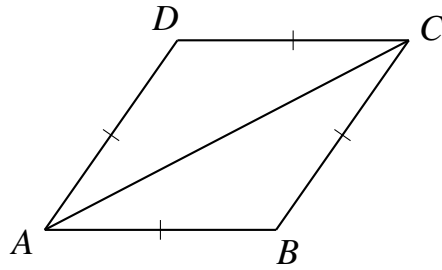


Not drawn accurately

$PQRS$ is a kite with $PQ = PS$ and $RQ = RS$.
Prove that angle $PQR =$ angle PSR .

[3 marks]

6 Here is a rhombus.



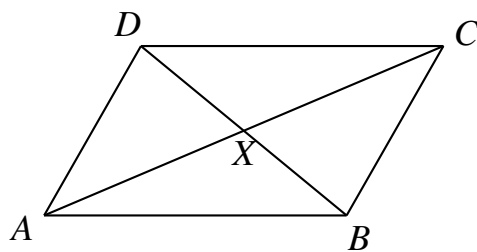
Not drawn accurately

$ABCD$ is a rhombus.

Prove that the diagonal AC bisects angle DAB .

[3 marks]

- 7 $ABCD$ is a parallelogram. The diagonals meet at X .



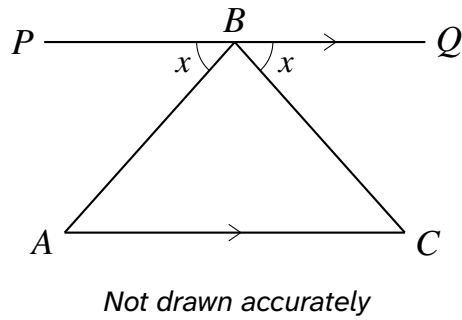
Not drawn accurately

For each statement, tick the correct box.

[3 marks]

	True	May be true	Not true
Triangles AXB and CXD are congruent	☐	☐	☐
$AC = BD$	☐	☐	☐
Triangles ABX and ABC are congruent	☐	☐	☐
Angle BAC = angle DCA	☐	☐	☐

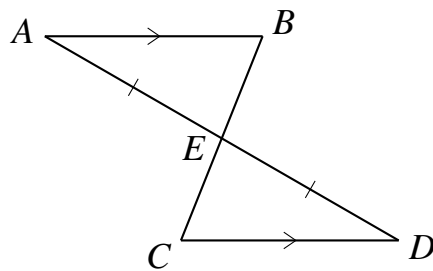
- 8 Here is a triangle and a straight line.



ABC is a triangle.
 PBQ is a straight line parallel to AC .
Angle $ABP = x$ and angle $CBQ = x$
Prove that $AB = BC$

[3 marks]

9 Here is a diagram.



Not drawn accurately

AB is parallel to DC .

AD and BC are straight lines that cross at E .

E is the midpoint of AD .

Prove that triangle ABE is congruent to triangle DCE .

[4 marks]
