

GCSE Maths: Congruent shapes and triangles (Foundation): worksheet

GCSE Maths - Transformations and Similarity - Foundation - Lesson 21.7

Name: _____

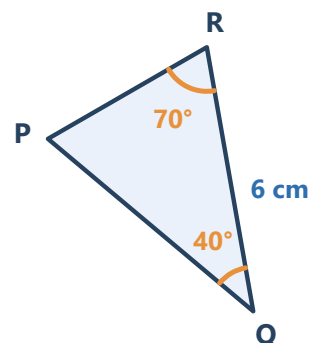
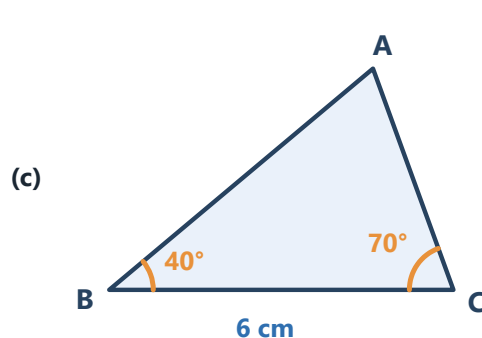
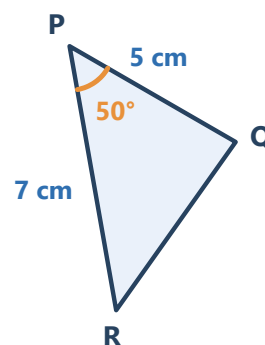
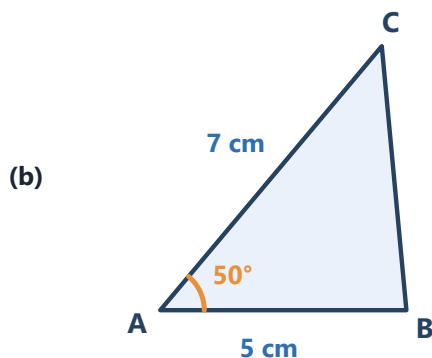
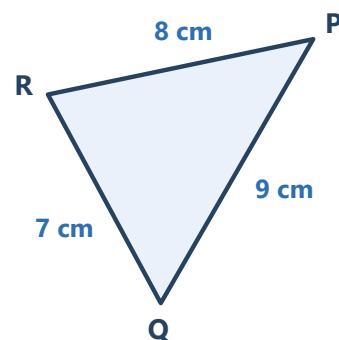
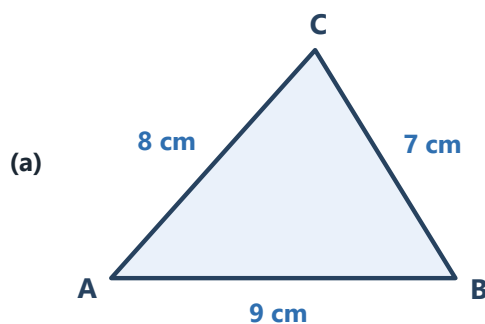
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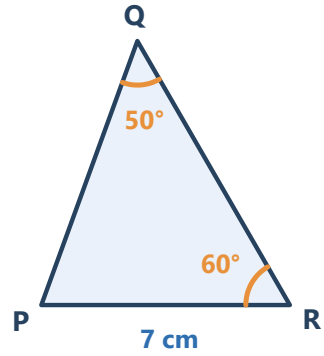
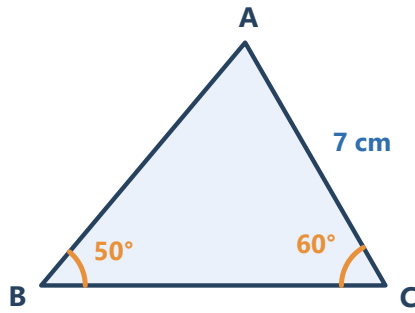
15 questions. Write your answers in the spaces. Answers and step-by-step help are free at websink.site/gcse/maths/ch21-transformations-congruence-similarity/foundation/congruent-shapes-and-triangles/

Exercise 21G Congruent triangles Non-calculator

- 1 In each pair of triangles, the lengths and angles are shown. Say whether the triangles are congruent, and give the condition (SSS, SAS, ASA, AAS or RHS) if they are.



(d)



(a) Pair a

Answer:

(b) Pair b

Answer:

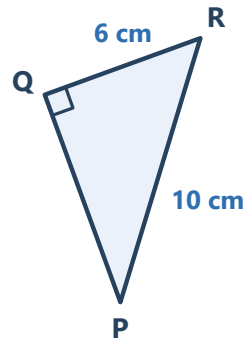
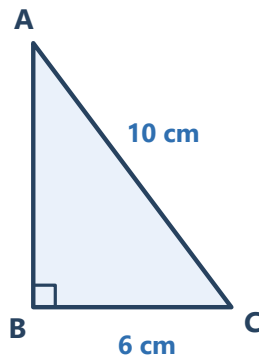
(c) Pair c

Answer:

(d) Pair d

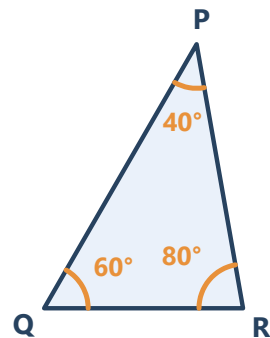
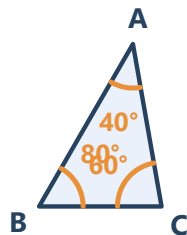
Answer:

2 Are triangles ABC and PQR congruent? Give a reason.



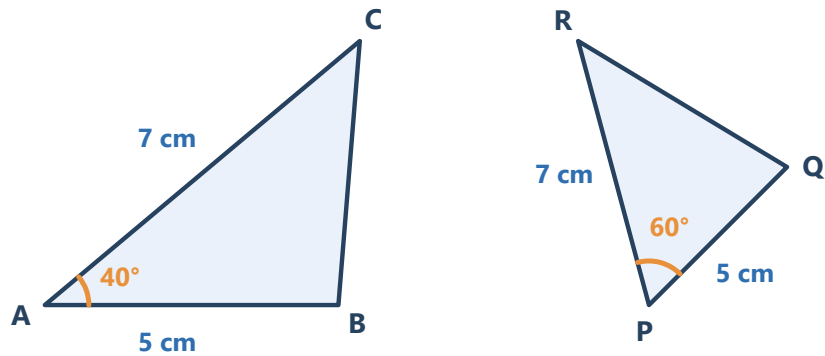
Answer:

3 Are these two triangles congruent? Give a reason.



Answer:

4 Are these two triangles congruent? Give a reason.



Answer:

- 5 Triangle ABC has sides $AB = 5$ cm, $BC = 6$ cm and $CA = 7$ cm. Triangle PQR has $PQ = 5$ cm, $QR = 6$ cm and $RP = 8$ cm. Are the triangles congruent? Give a reason.

Answer:

- 6 Triangle ABC has angles 50° , 60° and 70° . Triangle PQR has angles 50° , 60° and 70° and the side $PQ = 5$ cm. Anita says the triangles must be congruent. Explain why Anita could be wrong.

Answer:

- 7 Triangle ABC has $AB = 8$ cm, $AC = 6$ cm and angle $B = 40^\circ$. Triangle PQR has $PQ = 8$ cm, $PR = 6$ cm and angle $Q = 40^\circ$. Are these triangles necessarily congruent? Explain.

Answer:

- 8 **Challenge.** Two congruent triangles are placed together to make a quadrilateral. Triangle ABC has $AB = 6$ cm, $BC = 8$ cm and $AC = 10$ cm. A second triangle, congruent to ABC, is fitted along AC to make a parallelogram. What is the area of the parallelogram?

Answer:

Exercise 21H Congruence: more practice and proof Non-calculator

- 1 For each pair of triangles ABC and PQR, say whether the triangles are congruent. If they are, write the condition (SSS, SAS, ASA, AAS or RHS). If not, say "not enough information". (The lengths are in cm.)

(a) $AB = 5$, $BC = 7$, $CA = 9$ and $PQ = 5$, $QR = 7$, $RP = 9$

Answer:

(b) $AB = 6$, angle $B = 50^\circ$, $BC = 8$ and $PQ = 6$, angle $Q = 50^\circ$, $QR = 8$

Answer:

(c) angle $A = 40^\circ$, angle $B = 60^\circ$, $AB = 7$ and angle $P = 40^\circ$, angle $Q = 60^\circ$, $PQ = 7$

Answer:

(d) angles $A = 30^\circ$, $B = 70^\circ$, $C = 80^\circ$ and angles $P = 30^\circ$, $Q = 70^\circ$, $R = 80^\circ$

Answer:

(e) angle $B = 90^\circ$, $AC = 10$, $AB = 6$ and angle $Q = 90^\circ$, $PR = 10$, $PQ = 6$

Answer:

- 2 Ella says: "Triangles ABC and PQR both have angles of 50° and 60° , so they are congruent." Is she right? Explain.

Answer:

- 3 Two rectangles each have a perimeter of 16 cm. One is 6 cm by 2 cm and the other is 5 cm by 3 cm. Are they congruent? Explain.

Answer:

- 4 Triangle A is reflected in a line to give triangle B. Triangle B is then rotated about a point to give triangle C. Explain why triangles A and C are congruent.

Answer:

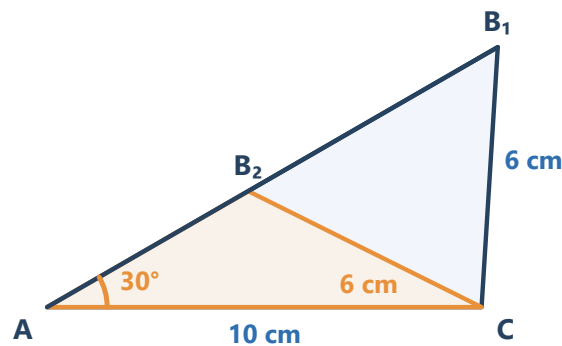
- 5 Triangle ABC is congruent to triangle PQR. The perimeter of ABC is 24 cm. In triangle PQR, $PQ = 7$ cm and $QR = 9$ cm. Work out the length of PR.

Answer:

- 6 Show that two squares, each with a perimeter of 20 cm, are congruent.

Answer:

- 7 **Challenge.** Triangle ABC has $AC = 10$ cm, $BC = 6$ cm and angle $A = 30^\circ$. Triangle PQR has $PR = 10$ cm, $QR = 6$ cm and angle $P = 30^\circ$. Explain why this is not enough to show that the triangles are congruent. (The diagram shows triangle ABC and a second triangle drawn on the same base.)



Answer:
