HIGHER

7.14 Congruent Triangles: 10-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Triangles ABC and DEF have AB = DE, BC = EF and AC = DF. Which congruence test proves the triangles are congruent?

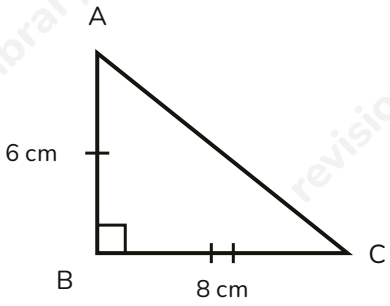
(Total for Question 1 is 1 mark)

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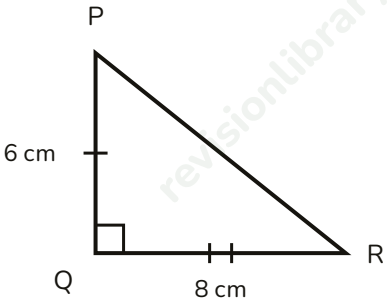
2 For each part below, decide whether the given information proves the two triangles are congruent, and if so, state the condition used.

(a) Triangle ABC and triangle PQR are drawn such that AB = PQ = 6 cm, BC = QR = 8 cm, and angle ABC = angle PQR = 90 degrees (the angle between the two given sides in each triangle). State the condition that proves triangle ABC is congruent to triangle PQR. **(1)**

Triangle ABC



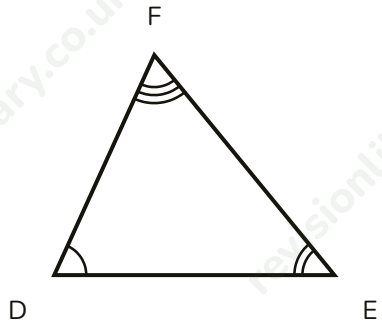
Triangle PQR



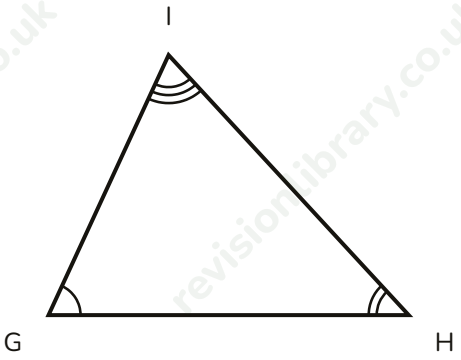
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(b) Triangle DEF and triangle GHI are drawn such that angle D = angle G, angle E = angle H and angle F = angle I (all three pairs of angles are equal), but no side lengths are marked as equal. State whether triangle DEF must be congruent to triangle GHI, giving a reason. **(1)**

Triangle DEF

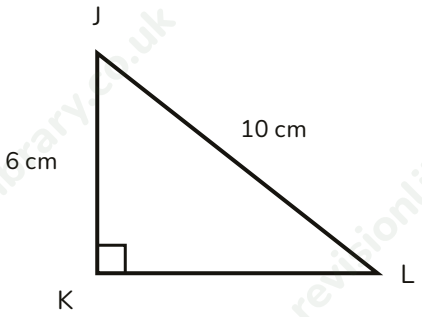


Triangle GHI

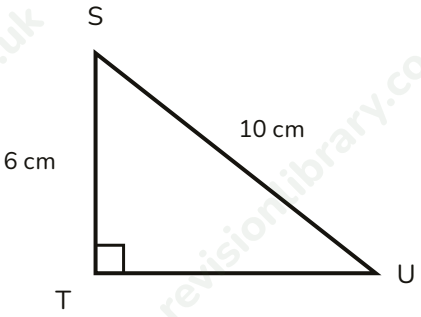


(c) Triangle JKL and triangle STU are right-angled at K and T respectively. The hypotenuses JL = SU = 10 cm, and one further pair of sides JK = ST = 6 cm. State the condition that proves triangle JKL is congruent to triangle STU. **(1)**

Triangle JKL



Triangle STU



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(d) Two triangles have two pairs of corresponding sides equal in length and one pair of corresponding angles equal, but the equal angle is not the angle included between the two given sides (the 'SSA' case). Which of the following statements is correct? **(1)**

- ☐ A) The triangles must always be congruent
- ☐ B) The triangles can never be congruent
- ☐ C) The triangles may or may not be congruent - SSA is not a valid congruence condition
- ☐ D) The triangles are congruent only if the equal angle is obtuse

(Total for Question 2 is 4 marks)

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3 Triangle ABC is right-angled at B with AB = 5, BC = 12 and AC = 13. Triangle DEF is right-angled at F with EF = 5 and DE = 13. Use congruence to find DF (labelled x in the second triangle).

(Total for Question 3 is 3 marks)

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Mark scheme · 7.14 Congruent Triangles: 10-minute Pack

Question 1

SSS cao **B1**

Answer: SSS (side-side-side) congruence test is sufficient to prove the triangles congruent.

Question 2

(a) SAS oe - two sides and the included angle equal **B1**

(a) Answer: SAS

(b) no oe - AAA only proves the triangles are similar, not congruent, since no side length is fixed **B1**

(b) Answer: No - not necessarily congruent (only similar)

(c) RHS oe - right angle, hypotenuse and one other side equal **B1**

(c) Answer: RHS

(d) C oe **B1**

(d) Answer: C

Question 3

identify hypotenuse and one leg equal so triangles are congruent by RHS **M1**

use correspondence to state DF corresponds to BC or compute DF using Pythagoras ($DF^2 = DE^2 - EF^2$) **M1**

12 cao **A1**

Answer: 12 cm (DF = 12). The Pythagorean check: DF = $\sqrt{13^2 - 5^2}$ = $\sqrt{169 - 25}$ = $\sqrt{144}$ = 12, corresponding to BC.

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