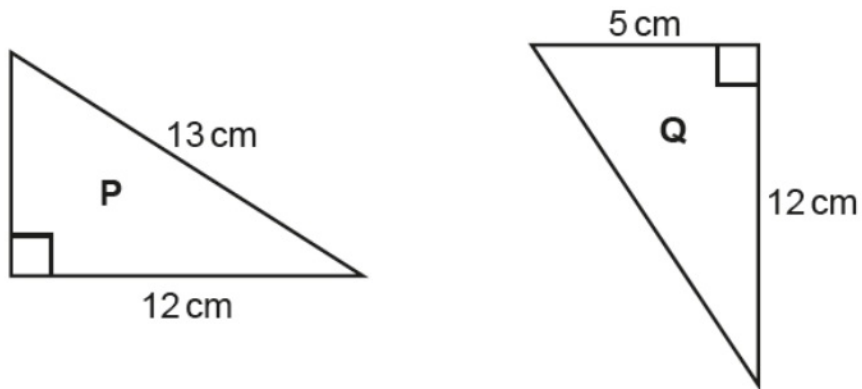


G51 - Proving Congruence

OCR

21 Triangles **P** and **Q** are right-angled.

Video created by W Neill



Not to scale

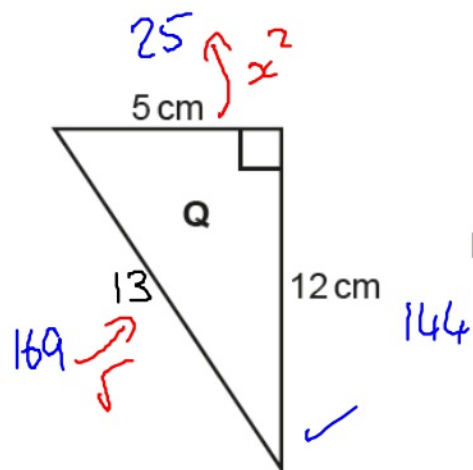
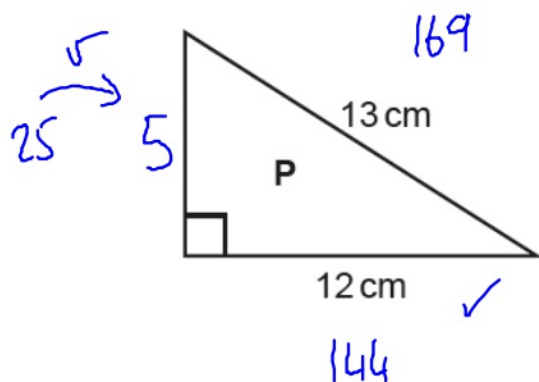
(a) Show that the two shorter sides in triangle **P** have the same lengths as the two shorter sides in triangle **Q**. [3]

(b) Explain why the two triangles are congruent.

.....
..... [1]

21 Triangles **P** and **Q** are right-angled.

Video created by W Neill



Not to scale

- (a) Show that the two shorter sides in triangle **P** have the same lengths as the two shorter sides in triangle **Q**. [3]

identical

- (b) Explain why the two triangles are congruent.

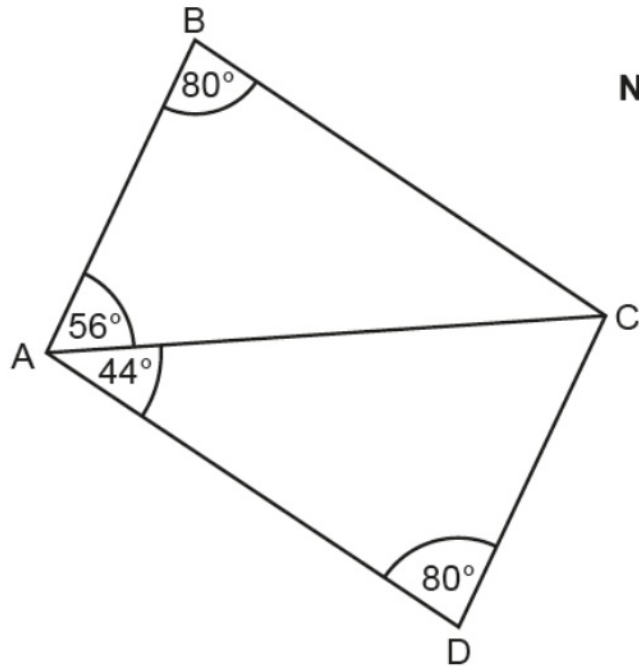
..... If they have 3 sides equal they must be congruent.

[1]

21 The diagram below shows two triangles.

Created by W Neill

GSI



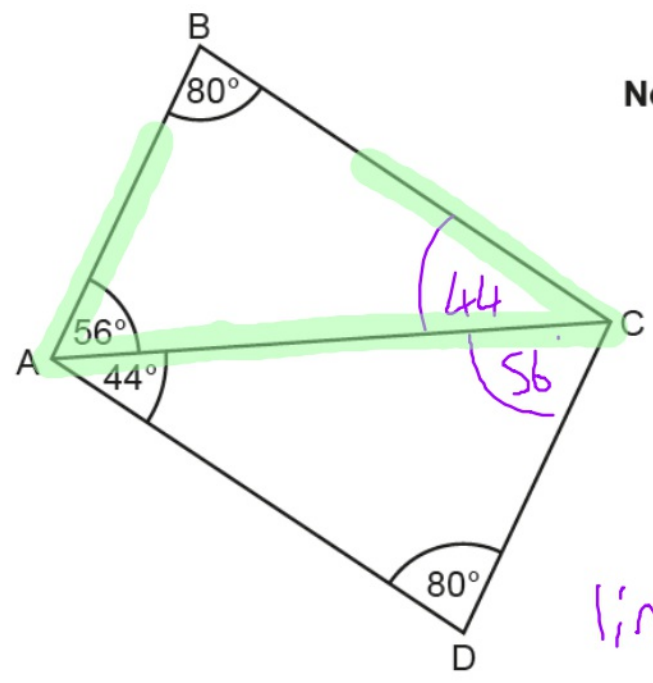
Not to scale

Prove that triangle ABC is congruent to triangle ACD .

21 The diagram below shows two triangles.
GSI

Created by W Neill

SSS SAS ASA RHS



Not to scale

→ Identical

Prove that triangle ABC is congruent to triangle ACD.

Angle BAC = Angle ACD

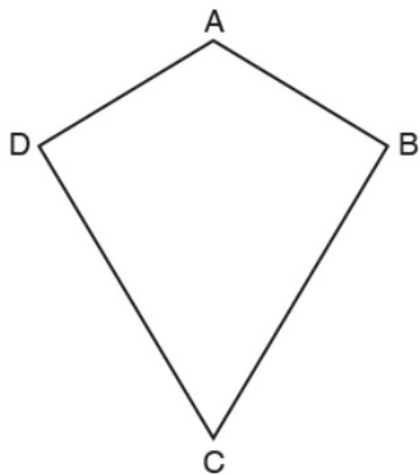
Angle ACB = Angle CAD

line AC = Line AC ... shared in both triangles

ASA... triangles are congruent

10 ABCD is a quadrilateral.
AD = AB and CD = CB.

GSI



Not to scale

Prove that angle ADC is equal to angle ABC.

.....

.....

.....

.....

.....

.....

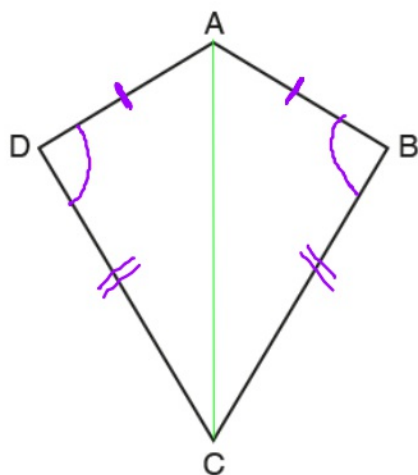
.....

[4]

10 ABCD is a quadrilateral.
AD = AB and CD = CB.

Created by W Neill

GSI



Not to scale

Prove SSS ... 3 sides equal

$AD = AB$... given

$DC = BC$.. given

$AC = AC$.. common in both triangles

Prove that angle ADC is equal to angle ABC.

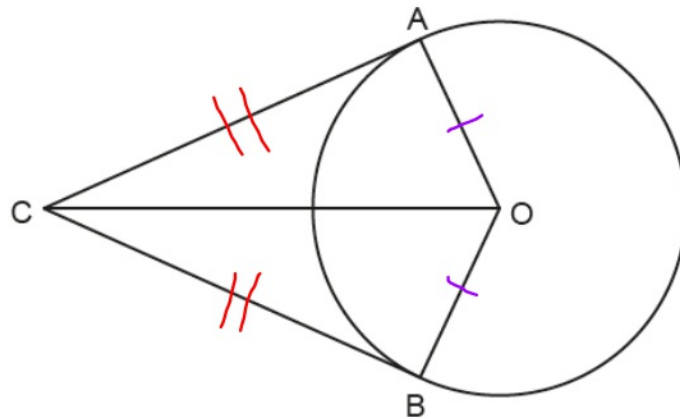
This proves SSS, triangles are congruent
 $\therefore \text{angle } adc = \text{angle } abc$

[4]

13 A and B are points on the circumference of a circle, centre O.
CA and CB are tangents to the circle.

G51
G63a

SSS /
SAS
ASA
RHS



Not to scale

identical

Prove that triangle OAC is congruent to triangle OBC.

Prove SSS $AO = BO$... both radii

CO is common in both triangles

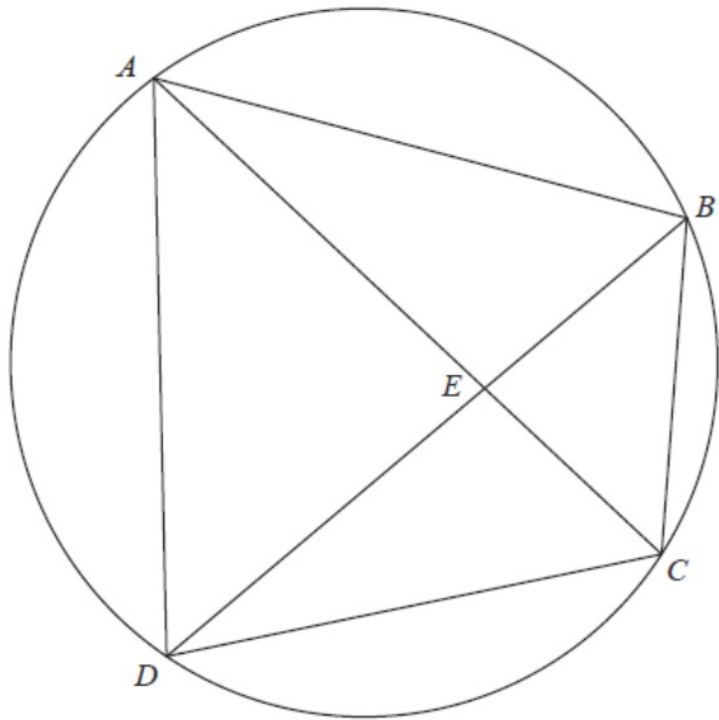
$CA = CB$ = Tangents to circle from same point

\therefore SSS, the two triangles are congruent.

[4]

15 A, B, C and D are four points on the circumference of a circle.

Video created by W Neill



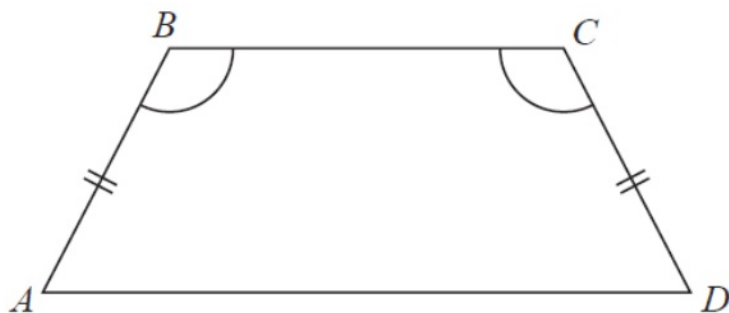
AEC and BED are straight lines.

Prove that triangle ABE and triangle DCE are similar.
You must give reasons for each stage of your working.

Edexcel

21 $ABCD$ is a quadrilateral.

Video created by W Neill



$$AB = CD.$$

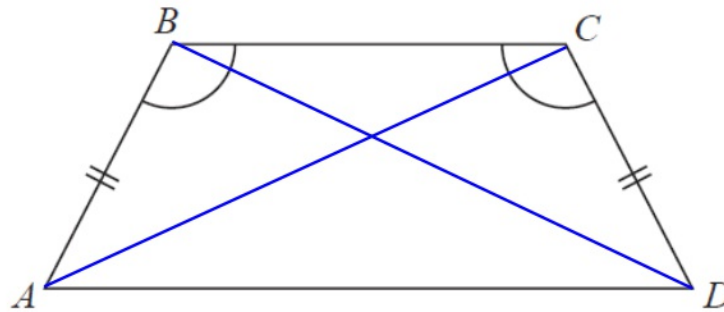
$$\text{Angle } ABC = \text{angle } BCD.$$

Prove that $AC = BD$.

(Total for Question 21 is 4 marks)

21 $ABCD$ is a quadrilateral.

Video created by W Neill

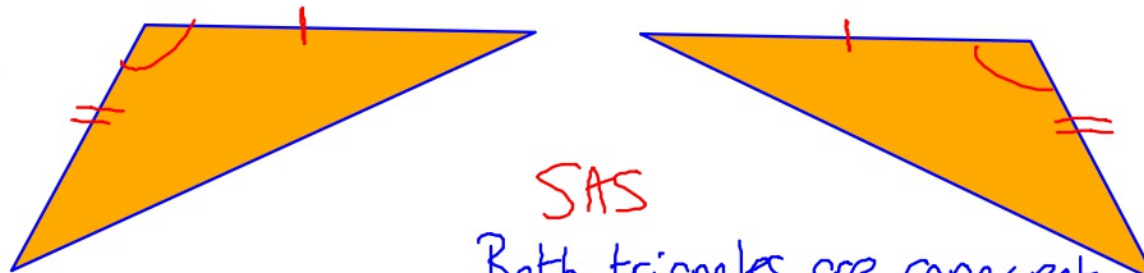


SAS
ASA
SSS
RHS_x

$AB = CD$.

Angle $ABC =$ angle BCD .

Prove that $AC = BD$.



$AB = CD$... given
 $BC = BC$... common
angle $ABC =$ angle BCD ... give

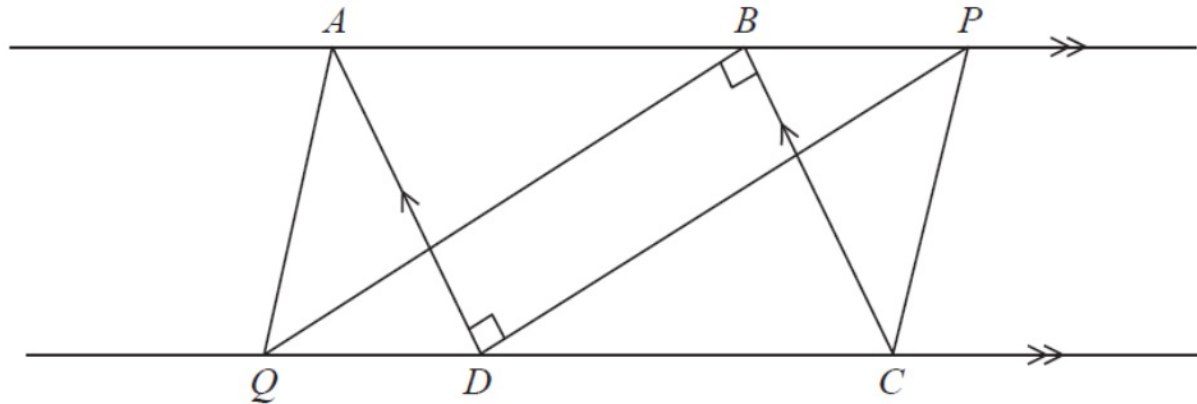
SAS
Both triangles are congruent
 $AC = BD$ ✓

(Total for Question 21 is 4 marks)

21

GSI

Video created by W Neill



$ABCD$ is a parallelogram.

ABP and QDC are straight lines.

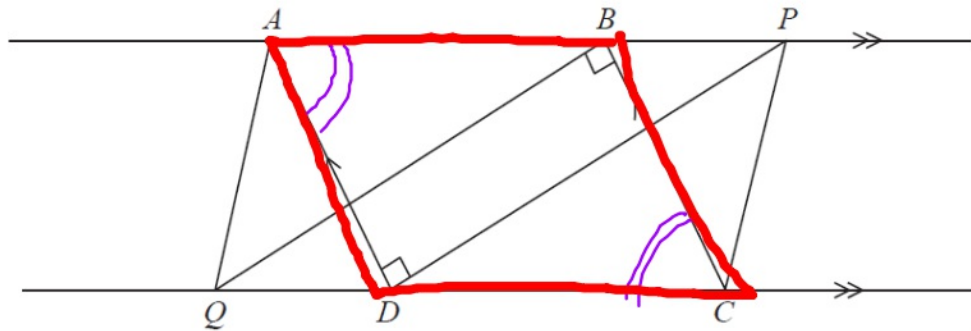
Angle $ADP = \text{angle } CBQ = 90^\circ$

(a) Prove that triangle ADP is congruent to triangle CBQ .

(3)

GSI

ASA
SAS
SSS



$ABCD$ is a parallelogram.
 ABP and QDC are straight lines.
 Angle $ADP = \text{angle } CBQ = 90^\circ$

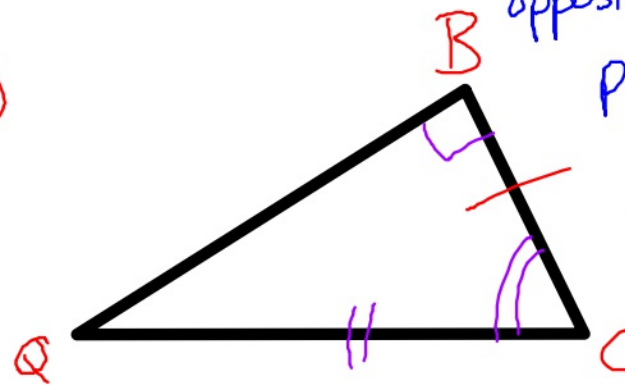
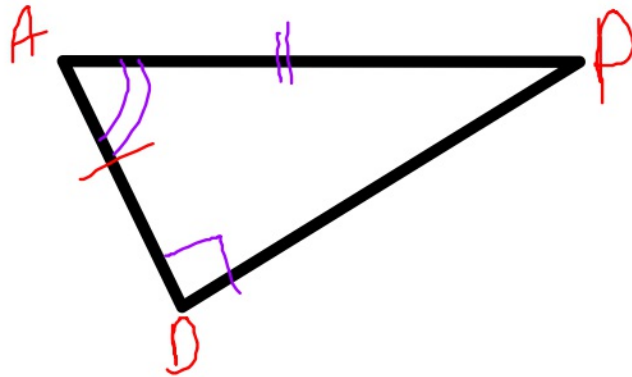
(a) Prove that triangle ADP is congruent to triangle CBQ .

Line $AD = \text{Line } BC$
 as they are opposites
 in a parallelogram.

Angle $ADP = CBQ = 90^\circ \dots$ given

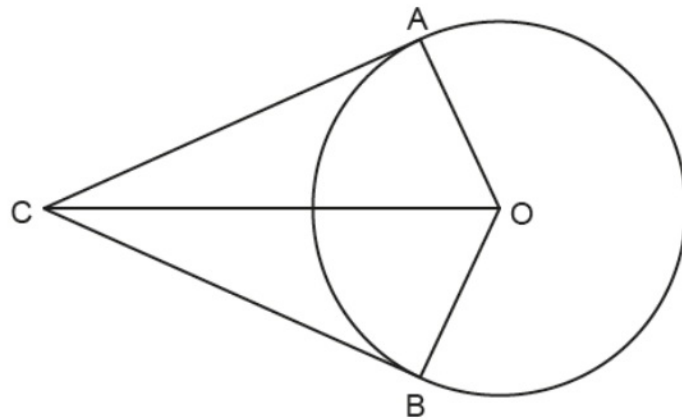
Angle $DAP = BCQ$ as they are
 opposite angles in a
 parallelogram

RHS



ASA is
 proven so
 triangles are
 congruent

- 13 A and B are points on the circumference of a circle, centre O.
CA and CB are tangents to the circle.



Not to scale

Prove that triangle OAC is congruent to triangle OBC.

.....

.....

.....

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.....

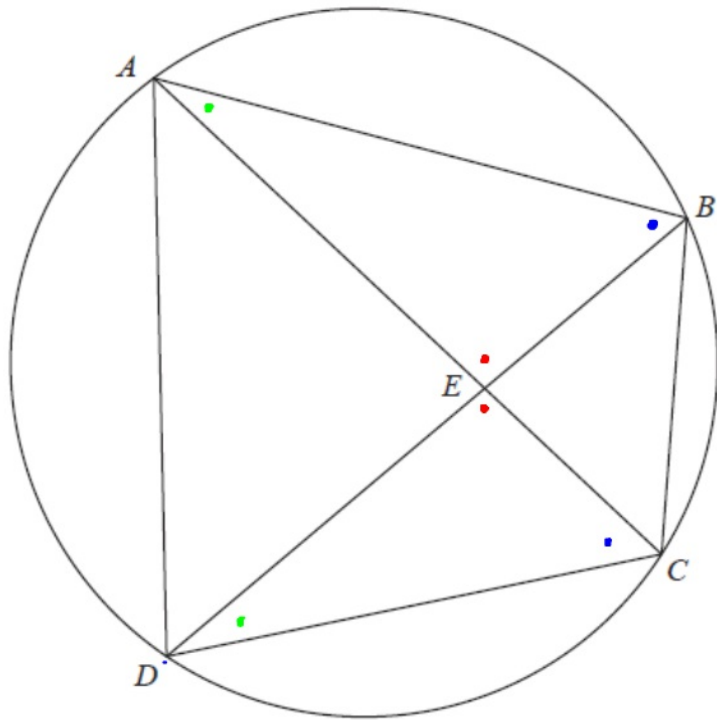
.....

.....

[4]

15 A, B, C and D are four points on the circumference of a circle.

Video created by W Neill



AEC and BED are straight lines.

Prove that triangle ABE and triangle DCE are similar.

You must give reasons for each stage of your working.

• angle $AEB =$ angle DEC as they are vertically opposite.

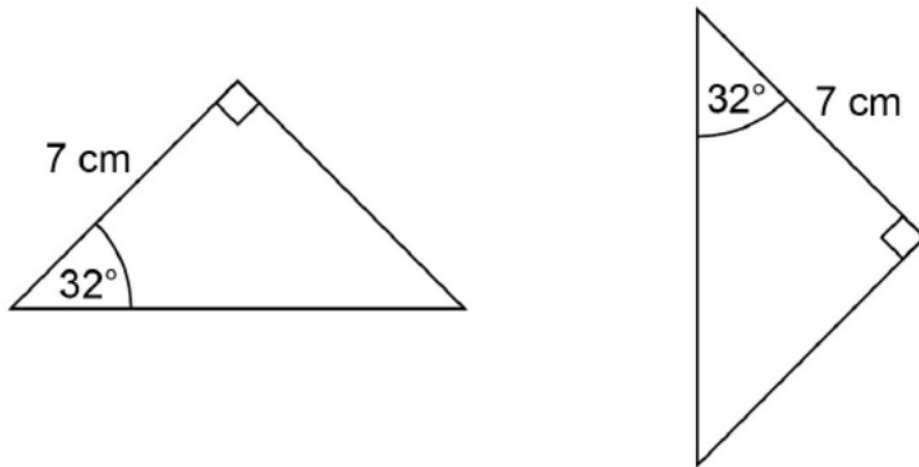
• angle $ABD =$ angle ACD
• angle $BAC =$ angle BDC } angles on the same segment.

As three angles are equal the triangles must be similar

AQA

2

GSI



Not drawn accurately

Circle the reason why these triangles are congruent.

[1 mark]

SSS

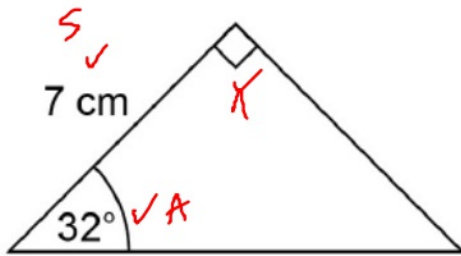
SAS

ASA

RHS

2

GSI



Not drawn accurately

S = Side
A = Angle
R = Right angle

Circle the reason why these triangles are congruent.

H = hyp

SSS
X

SAS
X

ASA
✓

RHS

[1 mark]