Name:

Exam Style Questions

Congruent Triangles

Corbettmaths

Equipment needed: Ruler, Pencil, Calculator, Pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

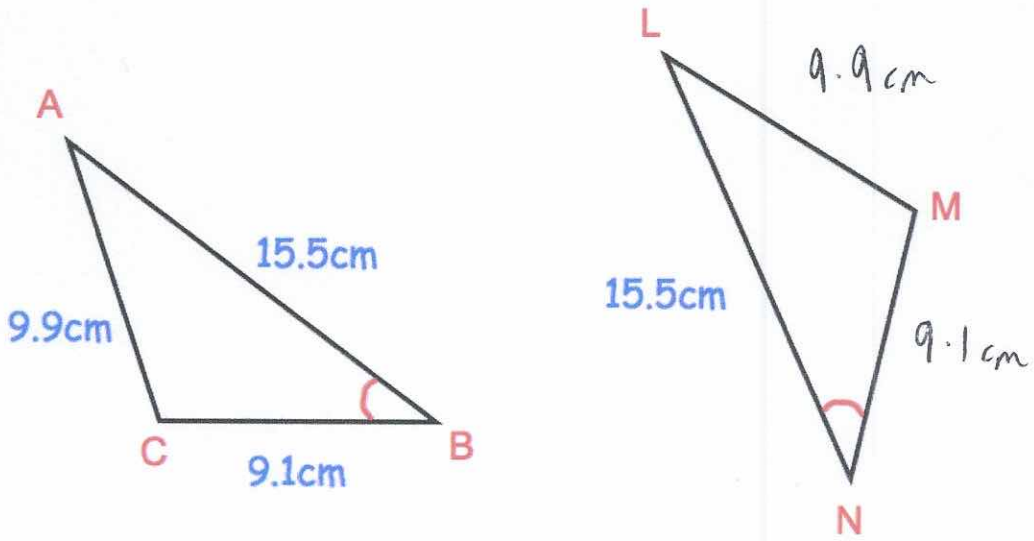
Video Tutorial

www.corbettmaths.com/contents

Videos 67, 328

Answers and Video Solutions

1. ABC and LMN are congruent triangles.
Angle B = Angle N



(a) Write down the length of MN.

9.1cm

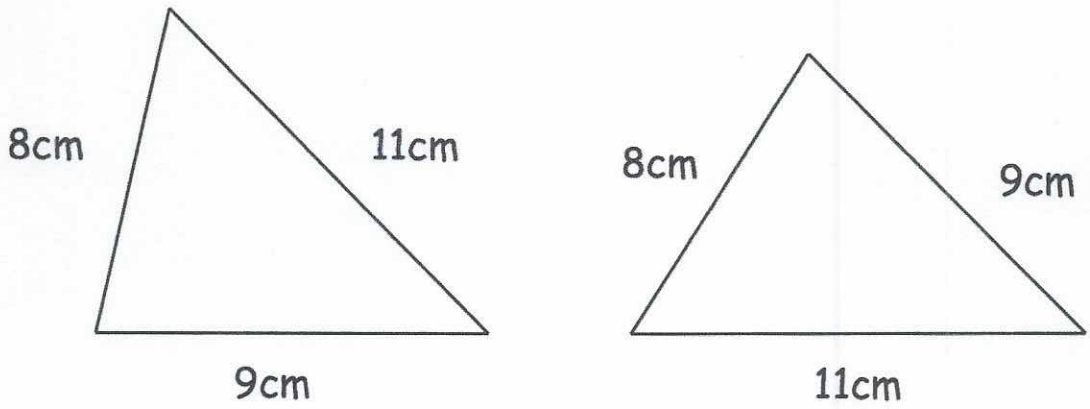
(1)

(b) Explain why angle A = angle L

As AB = LN and Angle B = Angle N
angle A must equal angle L

(2)

2. Shown below are two congruent triangles.

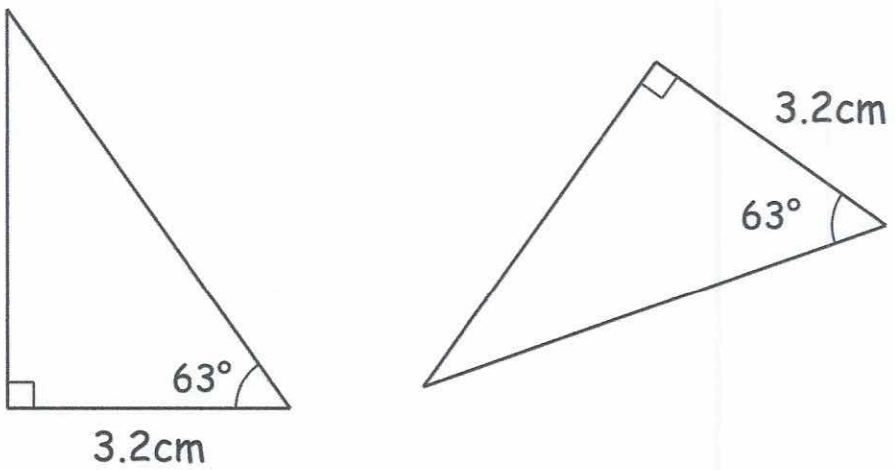


Circle the reason why the two triangle are congruent.

RHS SAS ASA SSS

(1)

3. Shown below are two congruent triangles.



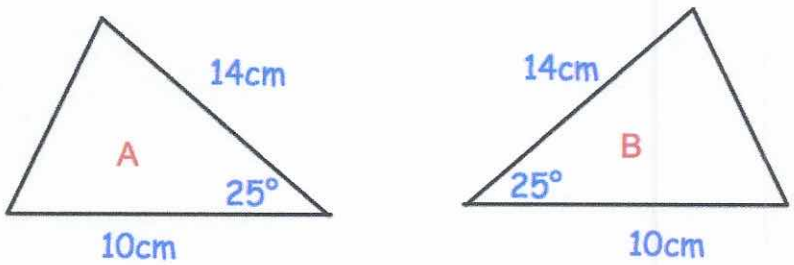
Circle the reason why the two triangle are congruent.

RHS SAS ASA SSS

(1)

4. For each pair below, state the condition why they are congruent.

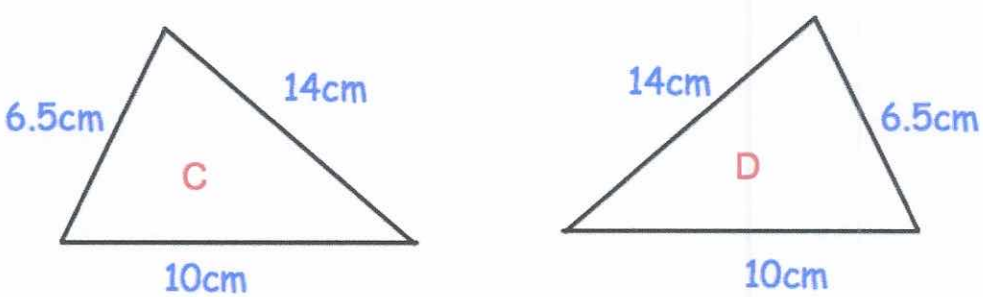
(a)



Condition: SAS

(1)

(b)



Condition: SSS

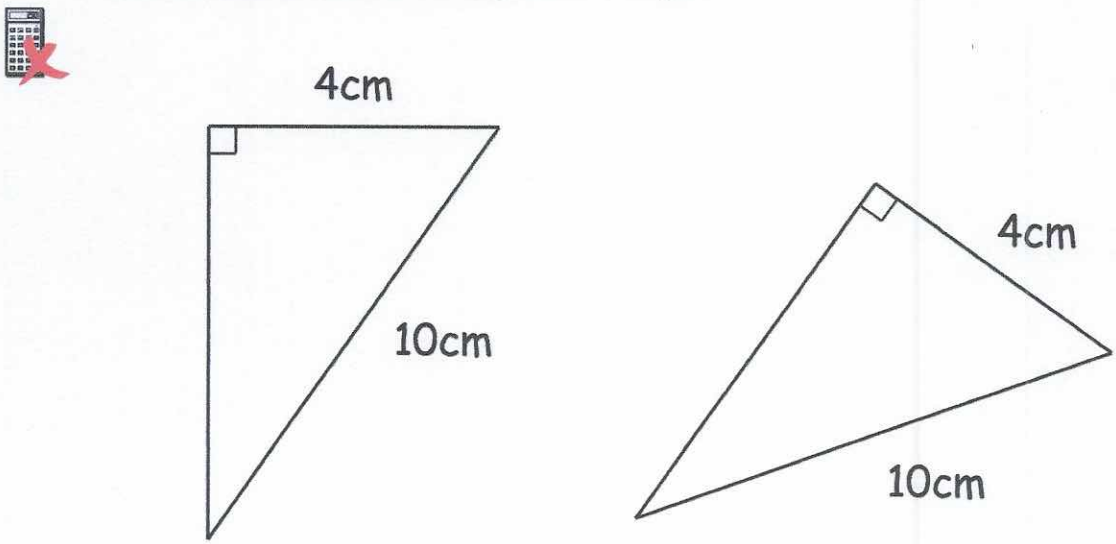
(1)

(c)

Condition: AAS

(1)

5. Shown below are two congruent triangles.



Circle the reason why the two triangle are congruent.

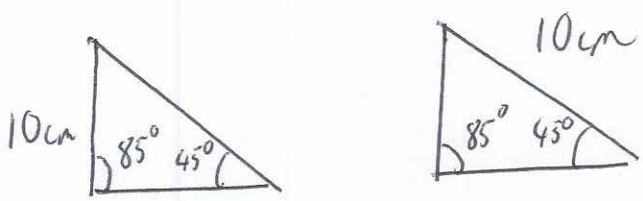
(RHS) SAS ASA SSS

(1)

6. James and Chris each draw a triangle with one side of 10cm, one angle of 45° and one angle of 85°

James says their triangles are congruent.

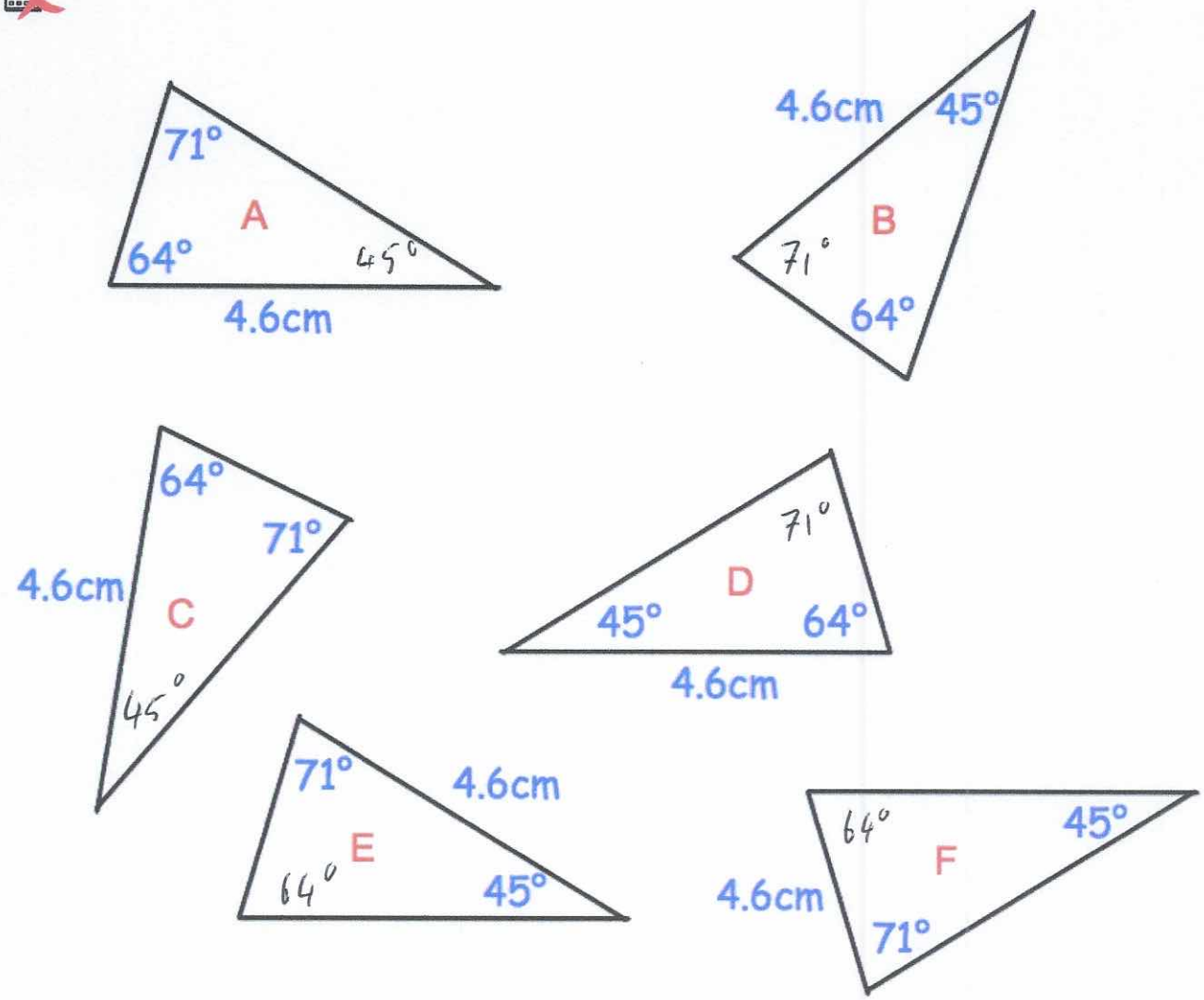
Explain why James is incorrect.



We do not know the position of the 10cm side in relation to the two angles. The two triangles above are not congruent.

(2)

7. Shown below are six triangles that are not drawn accurately.

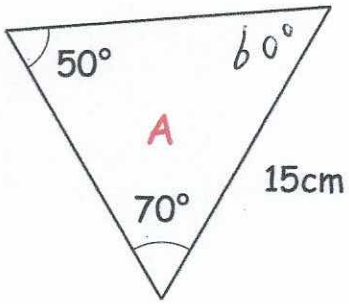


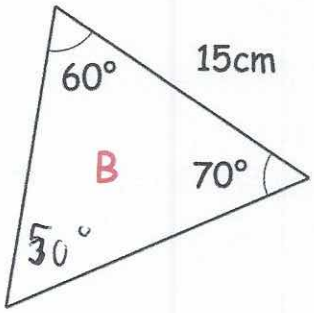
Which two triangles are congruent to triangle A?

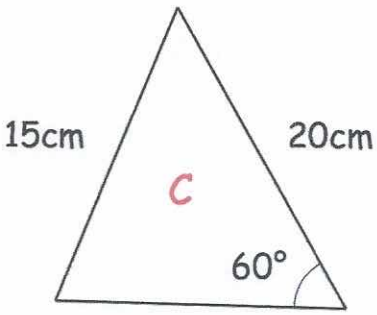
D and C

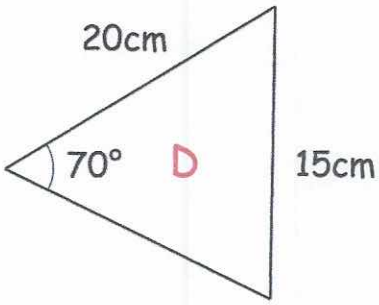
(2)

8. Shown below are four triangles.









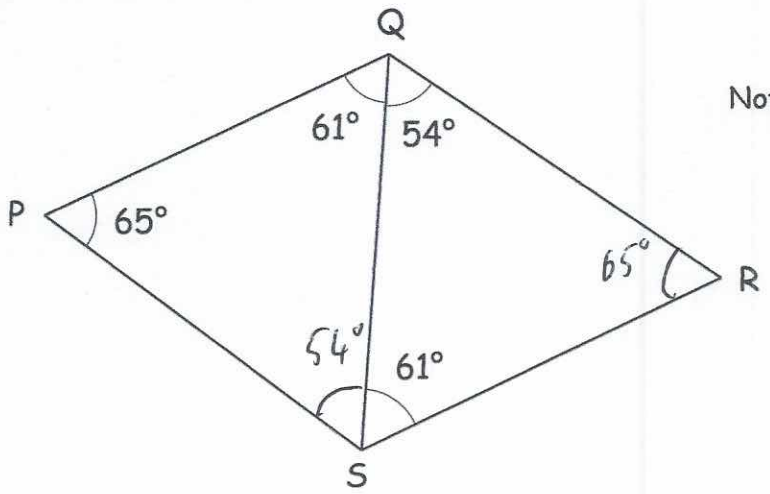
Which two triangles are congruent?

A and B

..... and .....

(2)

9. Shown below are two triangles, PQS and QRS.



Not drawn accurately

Prove triangles PQS and QRS are congruent.

$65 + 61 = 126$

$180 - 126 = 54°$

$\angle PSQ = \angle SQR = 54°$

$\angle PQS = \angle QSR = 61°$

QS is shared.

$\therefore$ $\triangle PQS$ and $\triangle QRS$ are congruent - ASA

(3)

10. Oscar says

"AAA can be used to prove two triangles are congruent."

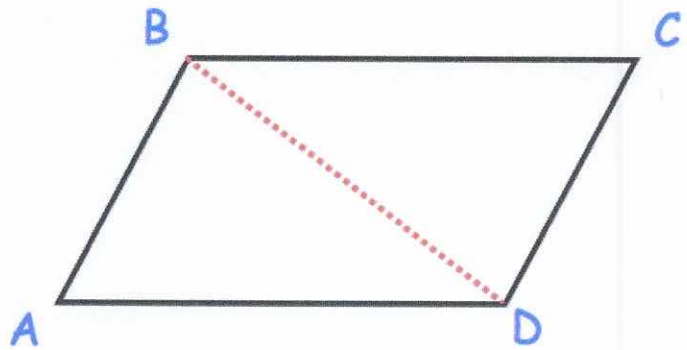
Evan says

"AAA can be used to prove two triangles are similar."

Who is correct?
Explain your answer.

Evan - with three equal angles, the triangles will definitely be similar. Information about the lengths of the sides would be needed to show they are congruent. **(2)**

11. ABCD is a parallelogram.



Prove that triangles ABD and BCD are congruent.

BD is shared

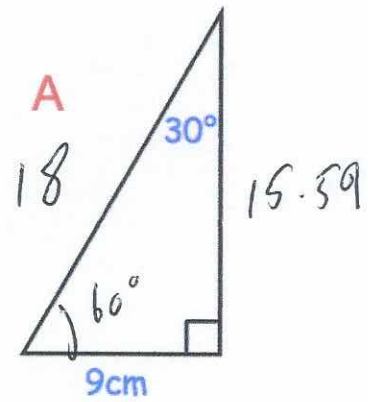
BA = CD (opposite sides of a parallelogram are equal).

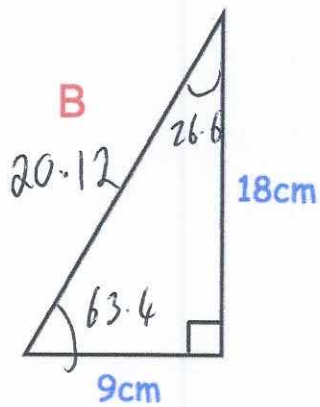
BC = AD (opposite sides of a parallelogram are equal).

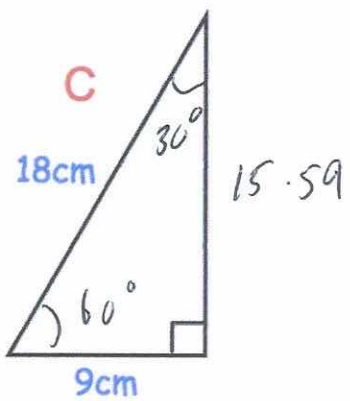
therefore ABD and BCD are congruent due to SSS.

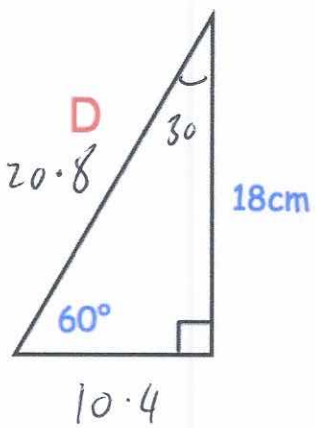
(4)

12. Two of the triangles below are congruent.









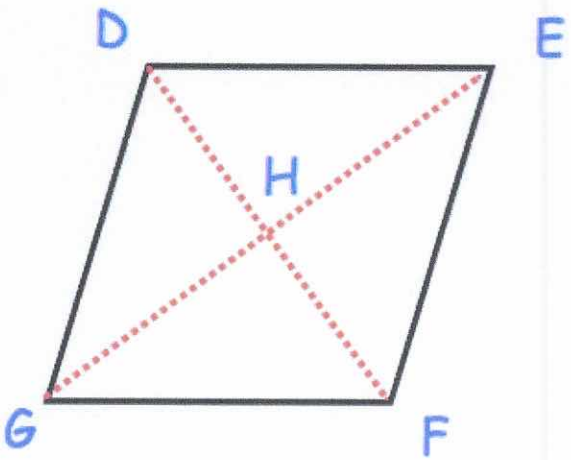
Identify the two congruent triangles and explain your answer.

A and C

Reason: will depend on values found.
e.g. The hypotenuse of A is 18cm (found using trig)
The base of A and C is 9cm.
Also A & C are both right angled.
∴ congruent due to RHS.

(4)

13. The diagram shows a rhombus DEFG.
The diagonals intersect at H.



Prove triangles DGH and EFH are congruent.

DG = EF as rhombus (all sides equal)

DH = HF as diagonals bisect each other.

GH = EH "

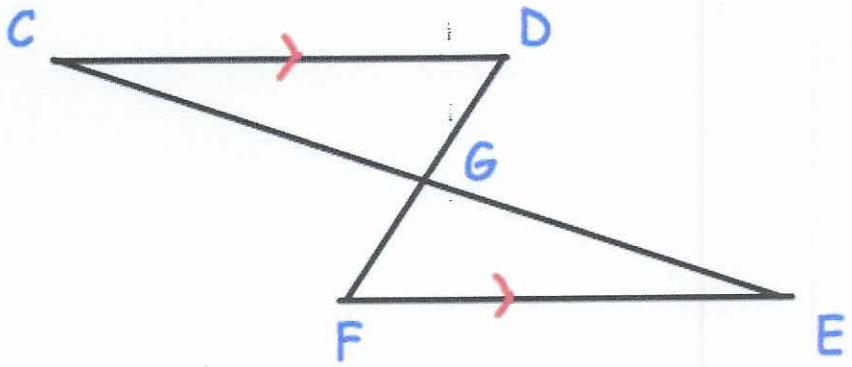
ΔDGH and ΔEFH are congruent

due to SSS.

(4)

14. In the diagram, the lines CE and DF intersect at G.

CD and FE are parallel and CD = FE.



Prove that triangles CDG and EFG are congruent.

CD = FE (given)

∠DCE = ∠FEC (alternate angles are equal).

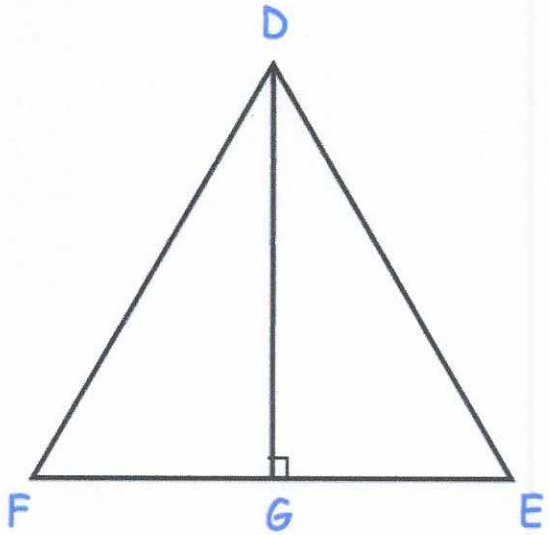
∠CDF = ∠EFD (alternate angles are equal).

△CDG is congruent to △EFG.

due to ASA.

(4)

15. DEF is an equilateral triangle.



G lies on EF.
DG is perpendicular to FE.

Prove DFG is congruent to DEG.

DG is shared.

DF = DE as equilateral triangle.

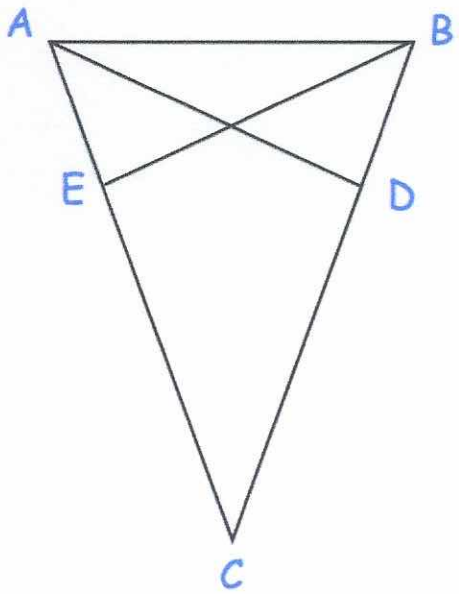
$\angle DGE = \angle DGF = 90^\circ$

∴ congruent due to RHS.

*other explanations are possible.

(3)

16. ABC is an isosceles triangle in which AC = BC.
D and E are points on BC and AC such that CE = CD.



Prove triangles ACD and BCE are congruent.

AC = BC (sides of an isosceles triangle are equal).

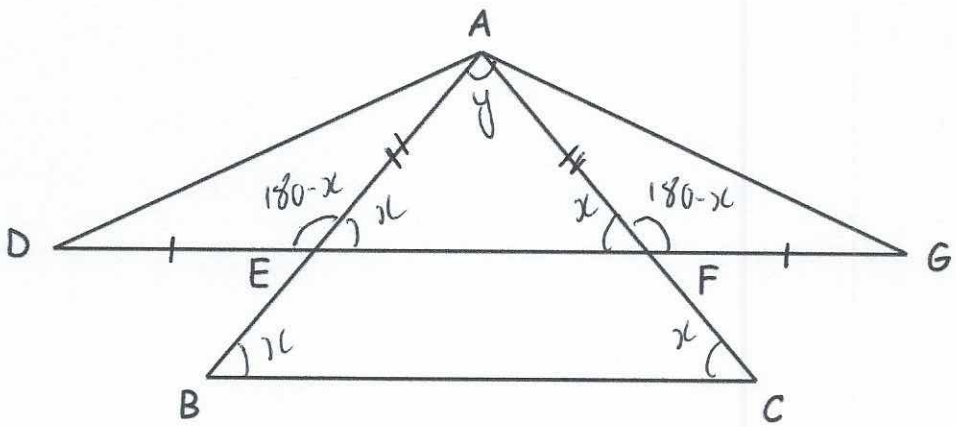
∠ACD = ∠BCE (shared)

CE = CD (given).

therefore the triangles are congruent due to SAS.

(4)

17. The diagram below shows triangles ABC and ADG.



ABC is an isosceles triangle.
The lines DG and BC are parallel.

DF = EG

Prove triangle ADE is congruent to triangle AFG.

$DF = DE + EF$

$EG = FG + EF$

$\therefore DE = FG$

As EF and BC are parallel, $\triangle AEF$ & $\triangle ABC$ are similar - $\therefore \triangle AEF$ is also isosceles.

So $AE = AF$

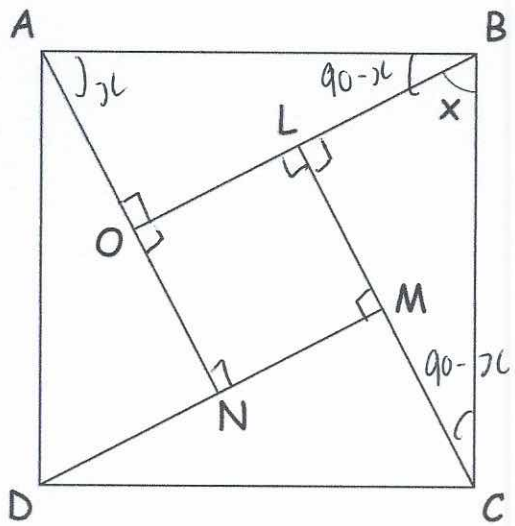
As $\angle AEF = \angle AFE = x$

$\angle AED = \angle AFG = 180 - x$.

$\therefore \triangle ADE$ is congruent to $\triangle AFG$ due to SAS.

(4)

18. ABCD and LMNO are squares.
Angle CBL = x



Prove that triangles ABO and CBL are congruent.

1) $\angle BLC = \angle AOB$ as LMNO is a square.

2) $\angle ABL = 90 - x$ as $\angle ABC$ is a right angle and $\angle CBL = x$.

3) $\angle BCL = 90 - x$ as angles in a triangle add to 180 and $\angle CBL = x$ and $\angle BLC = 90°$

4) $\angle OAB = x$ as the angles in a triangle add to 180° and $\angle ABL = 90 - x$ and $\angle AOB = 90$.

(4)

5) $AB = BC$ as ABCD is a square.

Congruent due to ASA.