Name: _____

GCSE (1 – 9)

Congruent Triangles

Instructions

- Use **black** ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
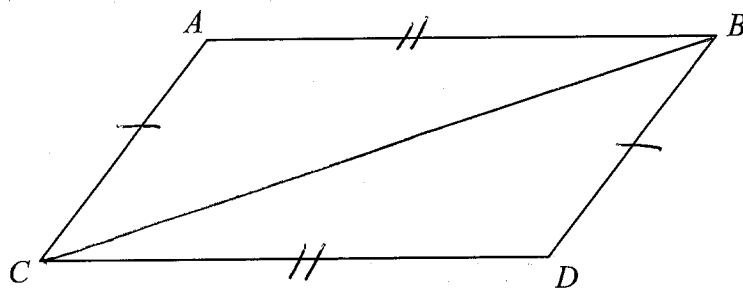- You must **show all your working out.**

Information

- The marks for each question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

1 *ABCD* is a parallelogram

Prove that triangle *ABC* is congruent to triangle *BCD*.

AC = BD   opposite sides of a parallelogram
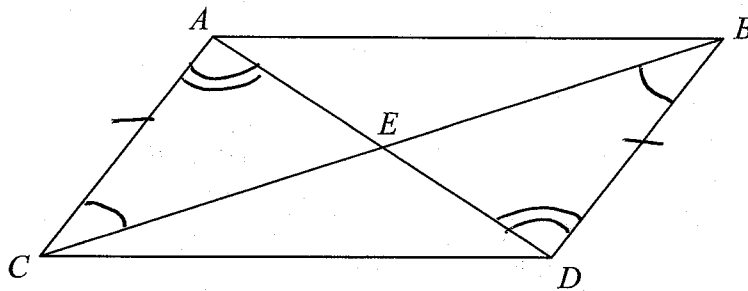   are equal

AB = CD   ——————— // ————————

BC   is common to both triangles

SSS

<div align="right">

(Total for Question 1 is 3 marks)

</div>

2   *ABCD* is a parallelogram
E is the point where the diagonals *AD* and *BC* meet.

Prove that triangle *ACE* is congruent to triangle *BDE*.

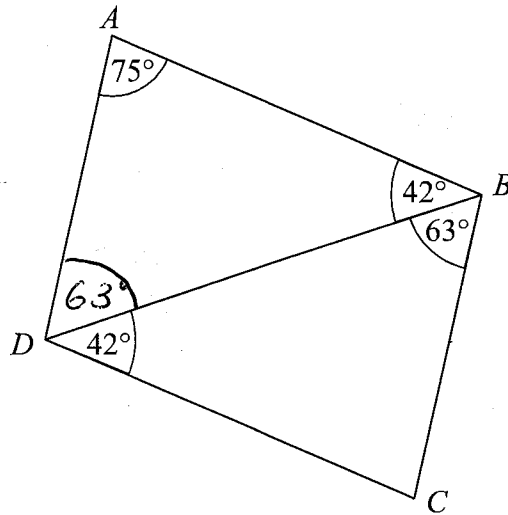$AC = BD$ opposite sides of a parallelogram are equal

$ACB = CBD$ Alternate angles are equal

$CAD = ADB$ _____ '' _____

ASA

3   The diagram shows two triangles, *ABD* and *BCD*.

Prove that triangle *ABD* is congruent to triangle *BCD*.

$ADB = 180 - 75 - 42$

$= 63°$ Angles in a triangle add to $180°$

BD is common to both triangles

$ABD = BDC$

$CBD = ADB$

$\underline{\underline{ASA}}$

4   *A* and *C* are points on a circle, centre *O*.
AB and *BC* are tangents to the circle.
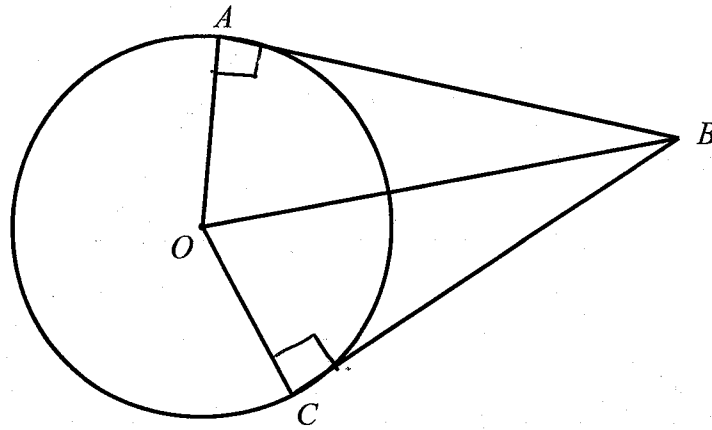
Prove that triangle *ABO* is congruent to triangle *BCO*.

$OCB = OAB = 90°$ Tangent meets
                      radius at 90°

OB is common to both triangles
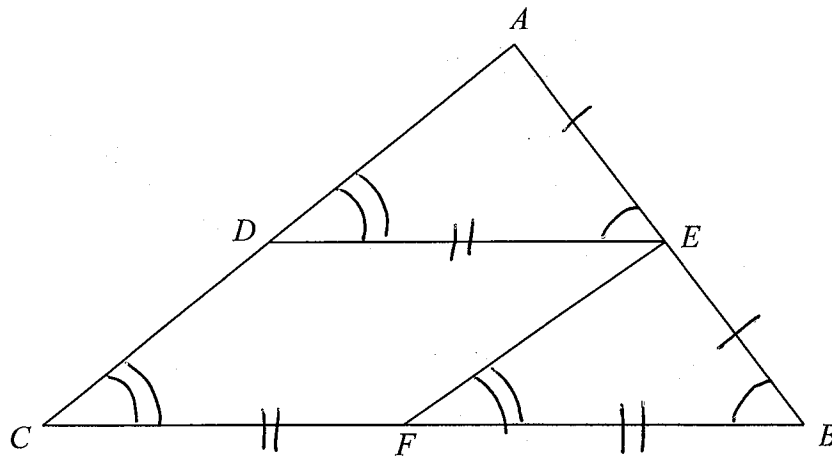
$OA = OC$ both a radius

R H S

5 *ABC* is a triangle.

CDEF is a parallelogram such that:
D is the midpoint of *AC*
E is the midpoint of *AB*
F is the midpoint of *BC*

Prove that triangle *ADE* is congruent to triangle *BEF*.

$AE = BE$ ~~A~~ *E* is the midpoint of *AB*

$AED = EBF$ corresponding angles are equal

$CF = DE$ opposite sides of a parallelogram are equal

$CF = BF$ *F* is the midpoint of *BC*

$\therefore DE = BF$

$\underline{\underline{SAS}}$

(Total for Question 5 is 4 marks)

6 *ABC* is an equilateral triangle.
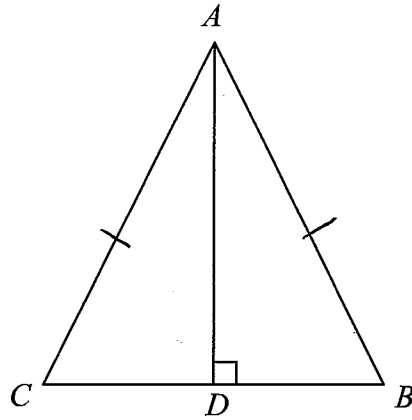
D lies on *BC*
AD is perpendicular to *BC*

Prove that angle *CAD* is equal to angle *BAD*.

$AB = AC$ Lengths of equilateral triangle
are equal

AD is common to both triangles

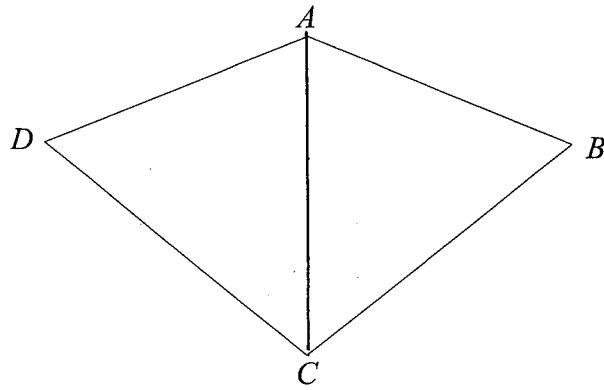Triangle ABD and triangle ACD are
right angled   (given)

                    triangle
Triangle ABD and ACD are congruent RHS

∴ Angle CAD = Angle BAD

(Total for Question 6 is 4 marks)

7   *ABCD* is a quadrilateral

$AB = AD$
$BC = CD$

Prove that angle *ABC* is equal to angle *ADC*.

Triangle ABC and triangle ACD are congruent

AB = AD   given

BC = CD   given

AC is common to both triangles

SSS

∴ Angle ABC = Angle ADC