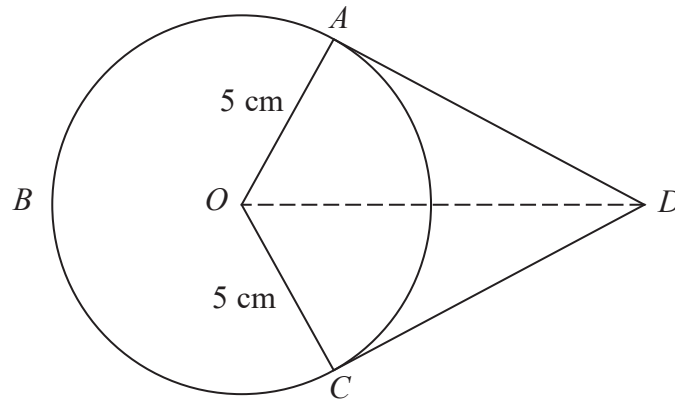**1**

A, *B* and *C* are points on a circle of radius 5 cm, centre *O*.
DA and *DC* are tangents to the circle.
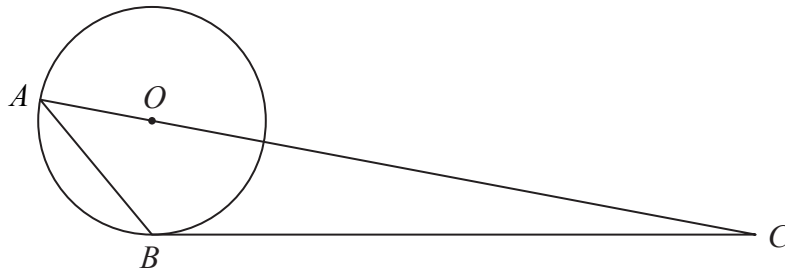*DO* = 9 cm

Work out the length of arc *ABC*.
Give your answer correct to 3 significant figures.

.... cm

(Total for Question 1 is 5 marks)

2

A and *B* are points on a circle, centre *O*.

BC is a tangent to the circle.
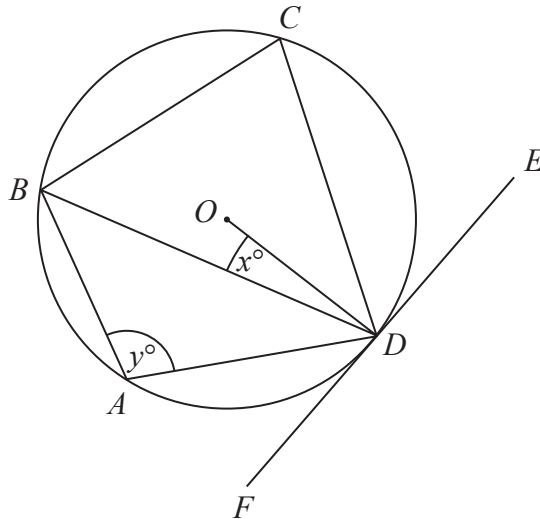*AOC* is a straight line.
Angle *ABO* = $x°$.

Find the size of angle *ACB*, in terms of *x*.
Give your answer in its simplest form.
Give reasons for each stage of your working.

(Total for Question 2 is 5 marks)

3

A, B, C and D are points on the circumference of a circle, centre O.
FDE is a tangent to the circle.

(a) Show that $y - x = 90$
You must give a reason for each stage of your working.

(3)

Dylan was asked to give some possible values for x and y.

He said,
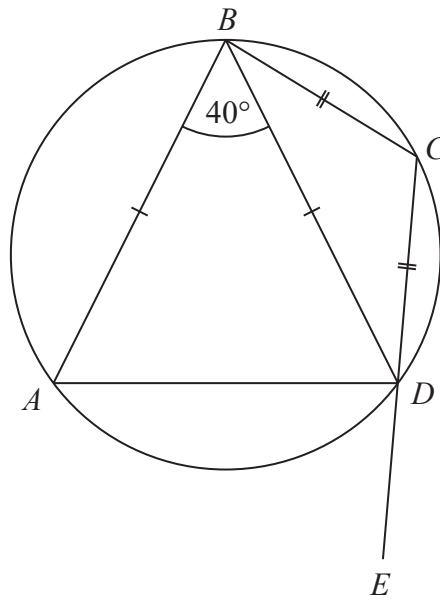"y could be 200 and x could be 110, because $200 - 110 = 90$"

(b) Is Dylan correct?
You must give a reason for your answer.

....

....

(1)

(Total for Question 3 is 4 marks)

4 The points *A*, *B*, *C* and *D* lie on a circle.
   CDE is a straight line.

BA = BD
CB = CD
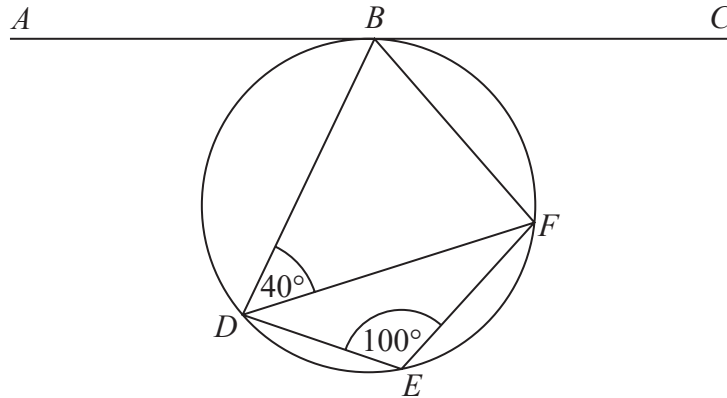Angle *ABD* = 40°

Work out the size of angle *ADE*.
You must give a reason for each stage of your working.

(Total for Question 4 is 5 marks)

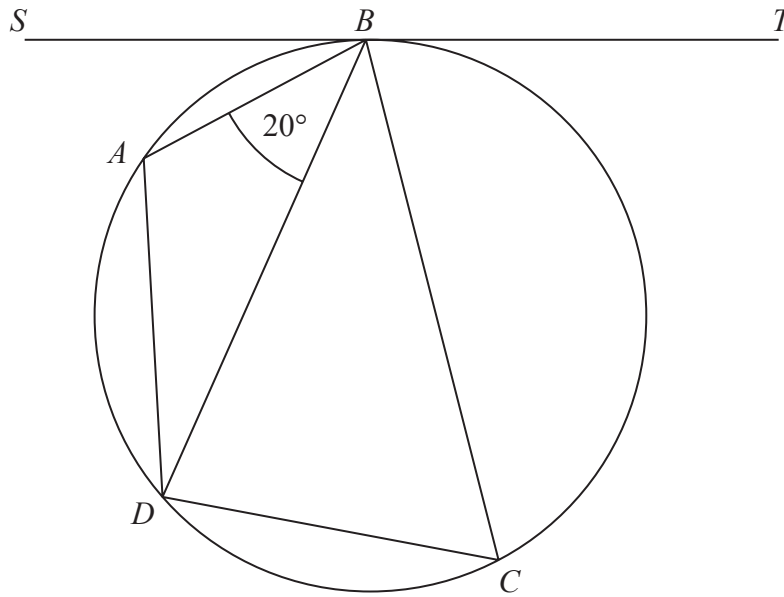**5**

Points B, D, E and F lie on a circle.
ABC is the tangent to the circle at B.

Find the size of angle ABD.
You must give a reason for each stage of your working.
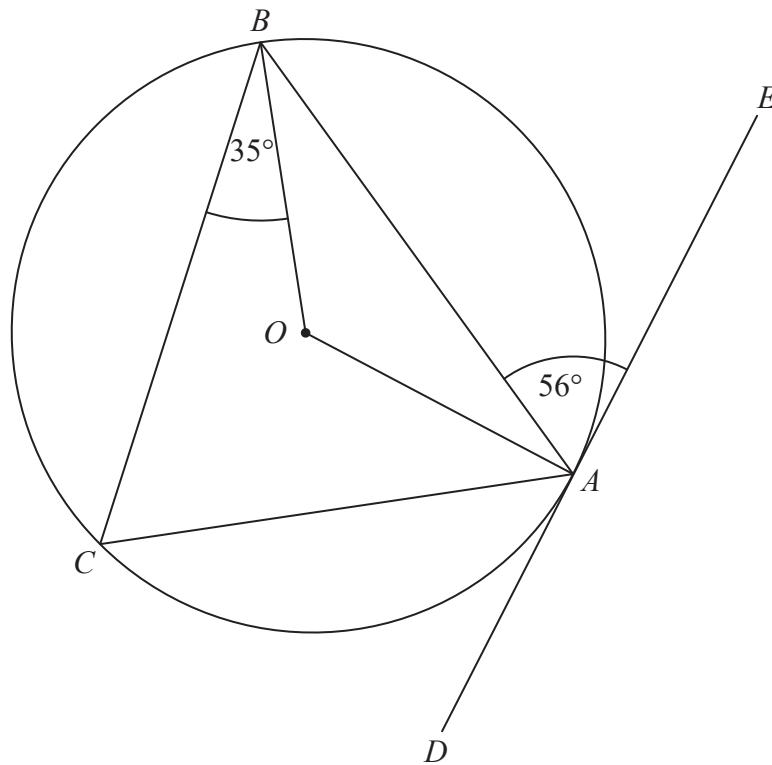
(Total for Question 5 is 4 marks)

6

A, B, C and D are four points on a circle.
SBT is a tangent to the circle.
Angle $ABD = 20°$

the size of angle BAD : the size of angle $BCD = 3 : 1$

Find the size of angle SBA.
Give a reason for each stage of your working.

....°
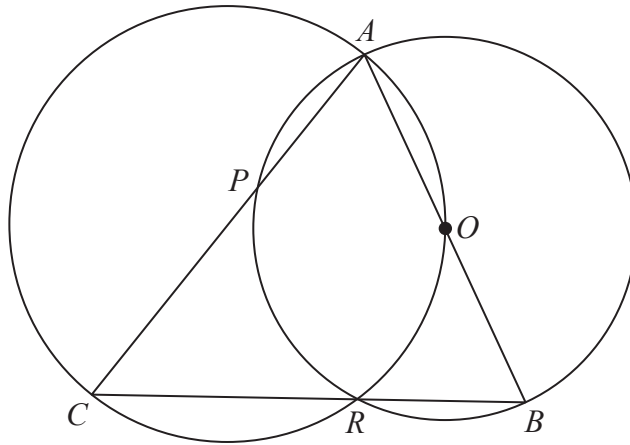
(Total for Question 6 is 4 marks)

7

A, *B* and *C* are points on the circumference of a circle, centre *O*.
DAE is the tangent to the circle at *A*.

Angle *BAE* = 56°
Angle *CBO* = 35°

Work out the size of angle *CAO*.
You must show all your working.

.... °

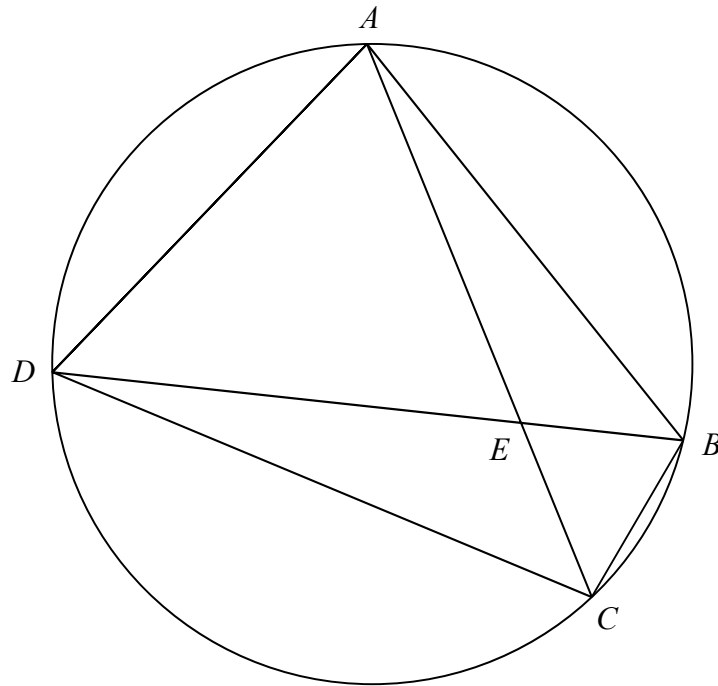**(Total for Question 7 is 3 marks)**

8

A, B, R and P are four points on a circle with centre O.
A, O, R and C are four points on a different circle.
The two circles intersect at the points A and R.

CPA, CRB and AOB are straight lines.

Prove that angle CAB = angle ABC.

(Total for Question 8 is 4 marks)

9 A, B, C and D are four points on a circle.
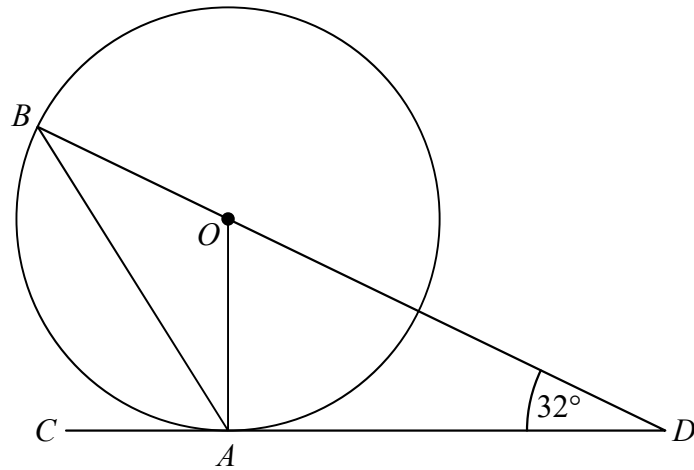

AEC and *DEB* are straight lines.

Triangle *AED* is an equilateral triangle.

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

(Total for Question 9 is 4 marks)

10

A and *B* are points on a circle with centre *O*.
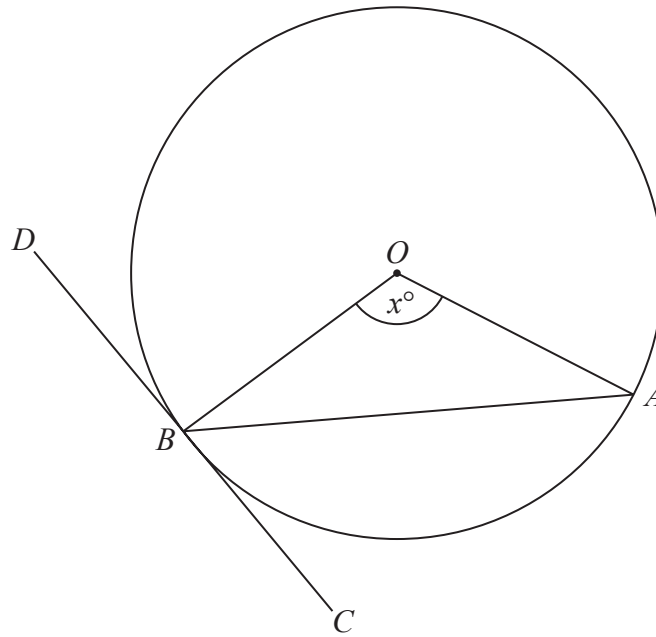*CAD* is the tangent to the circle at *A*.
BOD is a straight line.

Angle *ODA* = 32°

Work out the size of angle *CAB*.
You must show all your working.

....°

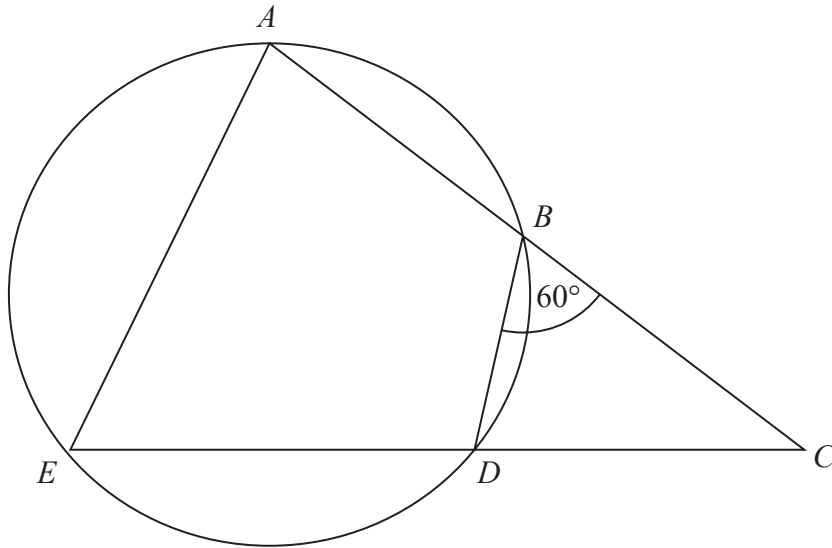**(Total for Question 10 is 3 marks)**

11

A and *B* are points on a circle, centre *O*.
DBC is the tangent to the circle at *B*.
Angle *AOB* = $x°$

Show that angle *ABC* = $\dfrac{1}{2}x°$

You must give a reason for each stage of your working.

(Total for Question 11 is 3 marks)

12

ABDE is a cyclic quadrilateral.
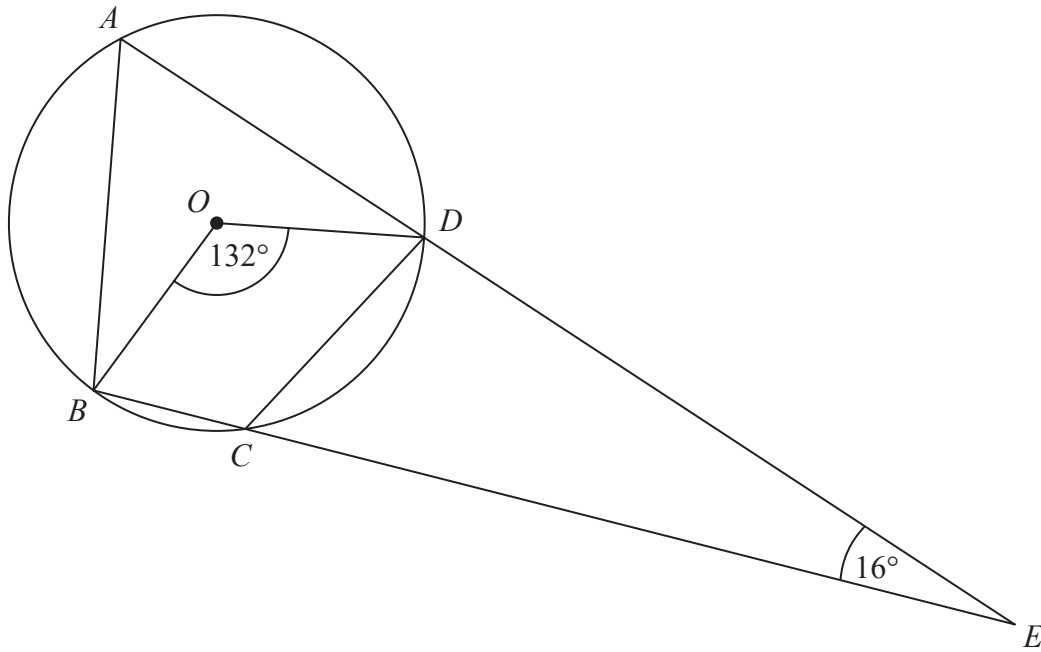*ABC* and *EDC* are straight lines.
Angle *DBC* = 60°

Given that

size of angle *EAB* : size of angle *BCD* = 2 : 1

work out the size of angle *BCD*.
You must show all your working.

.... °

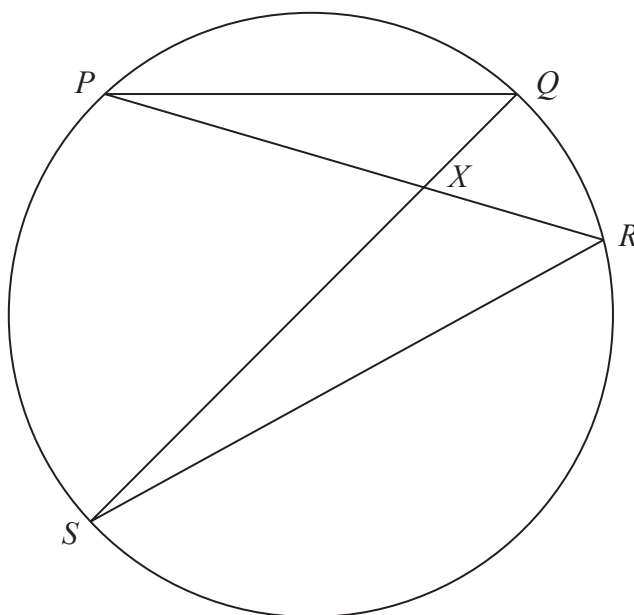**(Total for Question 12 is 4 marks)**

13 *A*, *B*, *C* and *D* are points on the circumference of a circle, centre *O*.
ADE and *BCE* are straight lines.

Work out the size of angle *CDE*.
Give a reason for each stage of your working.

.... °

(Total for Question 13 is 4 marks)

14 *P*, *Q*, *R* and *S* are four points on a circle.
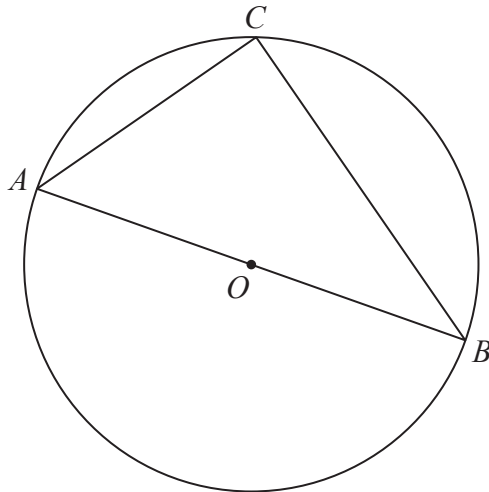

PXR and *SXQ* are straight lines.

Prove that triangle *PQX* and triangle *SRX* are similar.

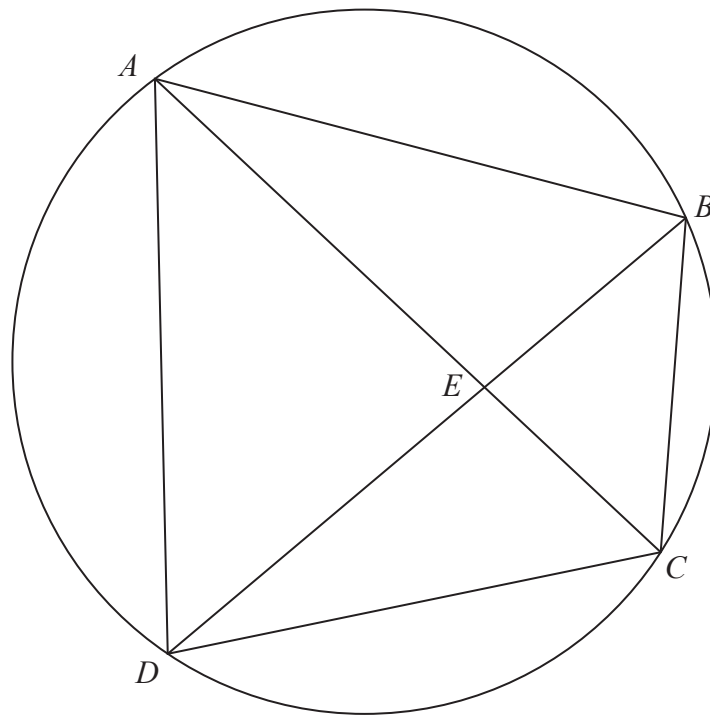**(Total for Question 14 is 3 marks)**

15

A, *B* and *C* are points on the circumference of a circle, centre *O*.
AOB is a diameter of the circle.

Prove that angle *ACB* is 90°
You must **not** use any circle theorems in your proof.

(Total for Question 15 is 4 marks)

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

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.

(Total for Question 16 is 3 marks)