868

868TUTORS

TUTORS

Preparation for

High School Mathematics

Circle Theorems

Solutions

Math

Instructions and Tips:

- ✓ You have 60 minutes to complete this worksheet
- ✓ This worksheet consists of 15 questions
- ✓ Write answers in the spaces provided
- ✓ All working must be clearly shown
- ✓ Diagrams are not drawn to scale

Student Name: _____

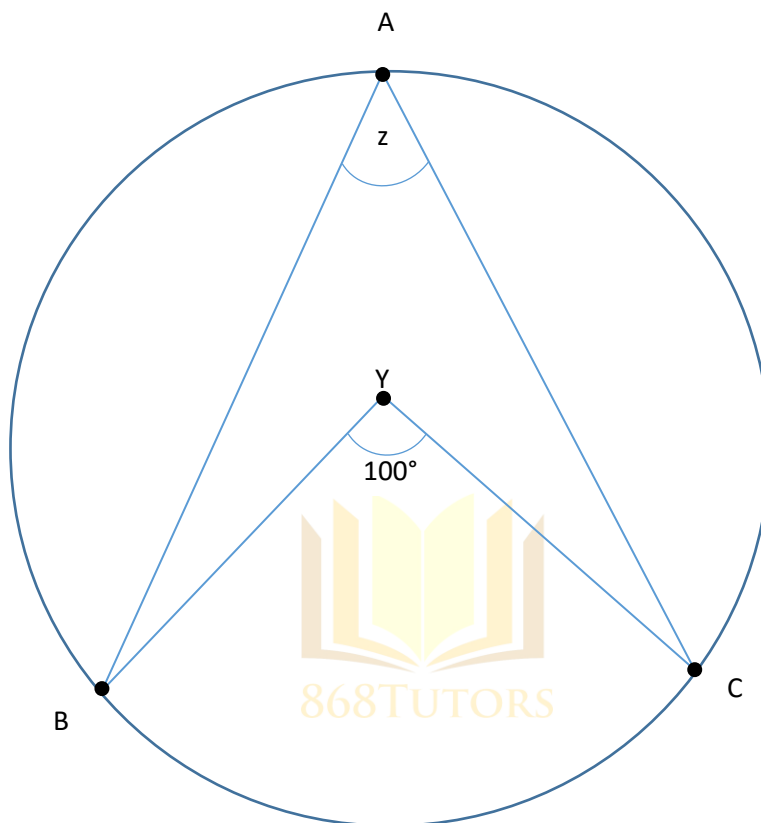Student ID: _____

Date: _ _ / _ _ / _ _ _ _

Total Score:

Highest Score:

Tutor's Comments:

Question 1

Consider the circle below with centre Y:

A

Z

Y

100°

B

C

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State the value of z and give a reason for your answer.

$Z = \dfrac{100^o}{2} = 50°$ **Z = 50˚**

Reason: The angle at the centre is twice the angle at the circumference.

(2 marks)

Question 1

Question 2

Consider the circle below with centre D:
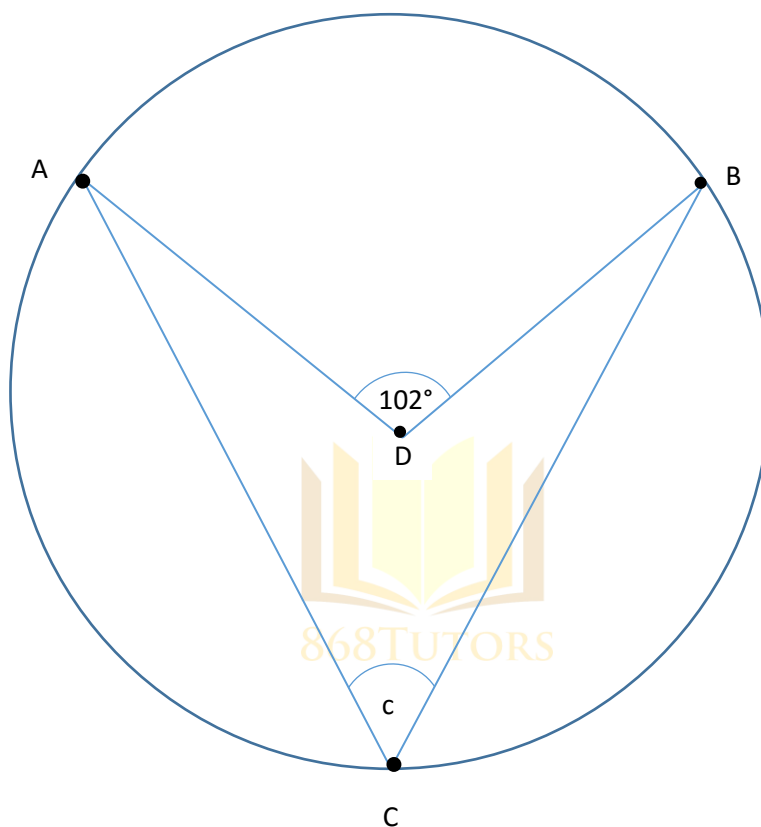
State the value of c and give a reason for your answer.

$c = \frac{102°}{2}$ **c = 51°**

Reason: The angle at the centre is twice the angle at the circumference.

(2 marks)

Question 3

Consider the circle below with centre P:

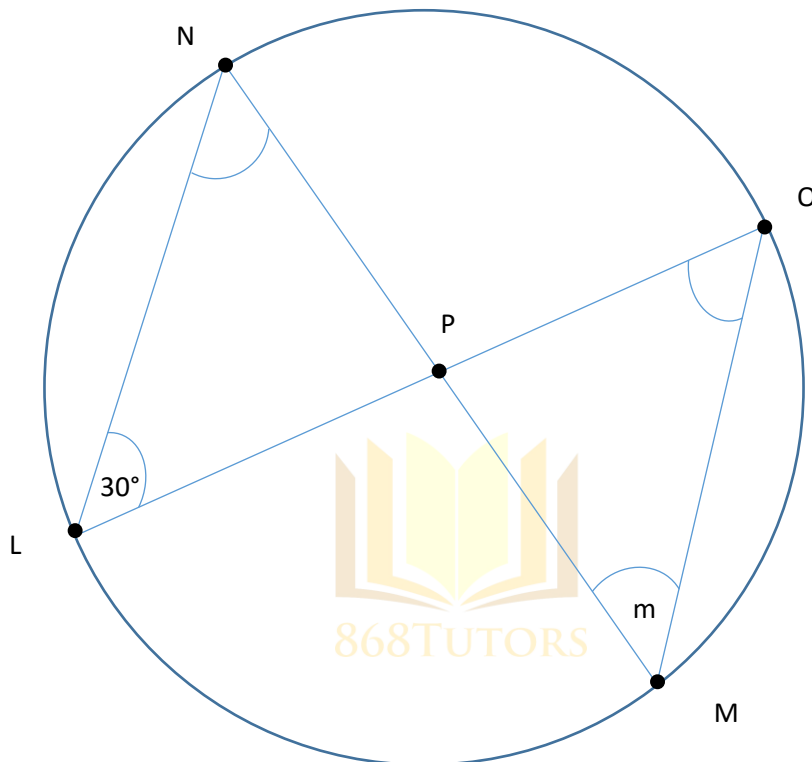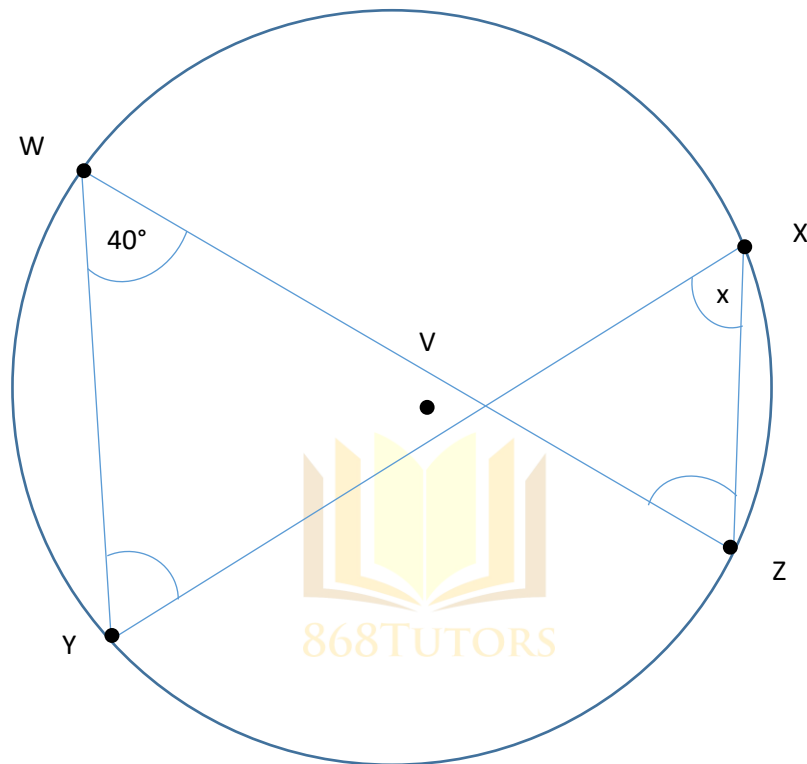**State the value of m and give a reason for your answer.**

m = 30°

Reason: Angles in the same segment are equal.

(2 marks)

Question 4

Consider the circle below with centre V:

State the value of x and give a reason for your answer.
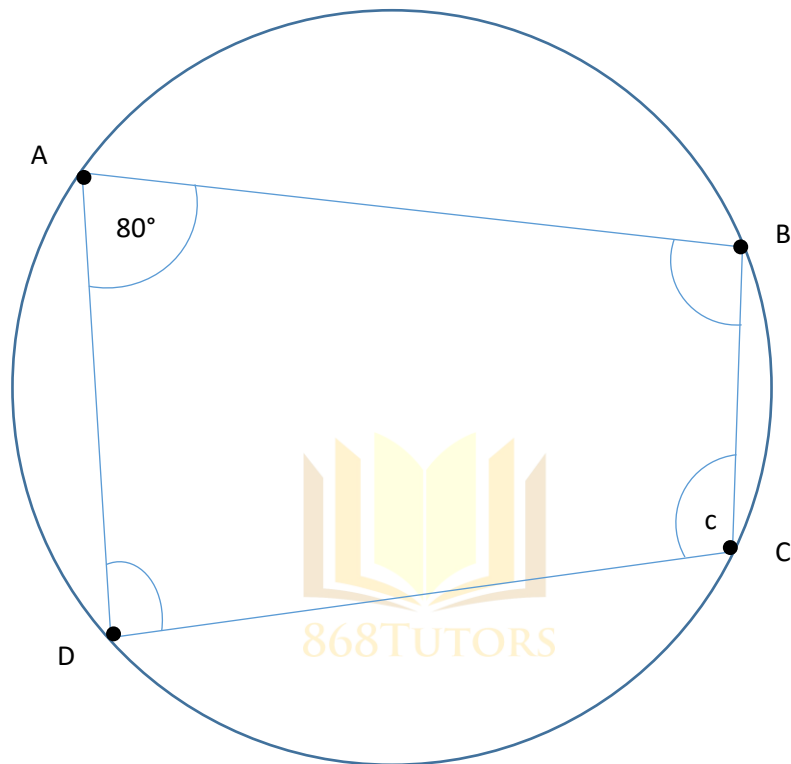
x = 40˚

Reason: Angles in the same segment are equal.

(2 marks)

Question 5

Consider the circle below:

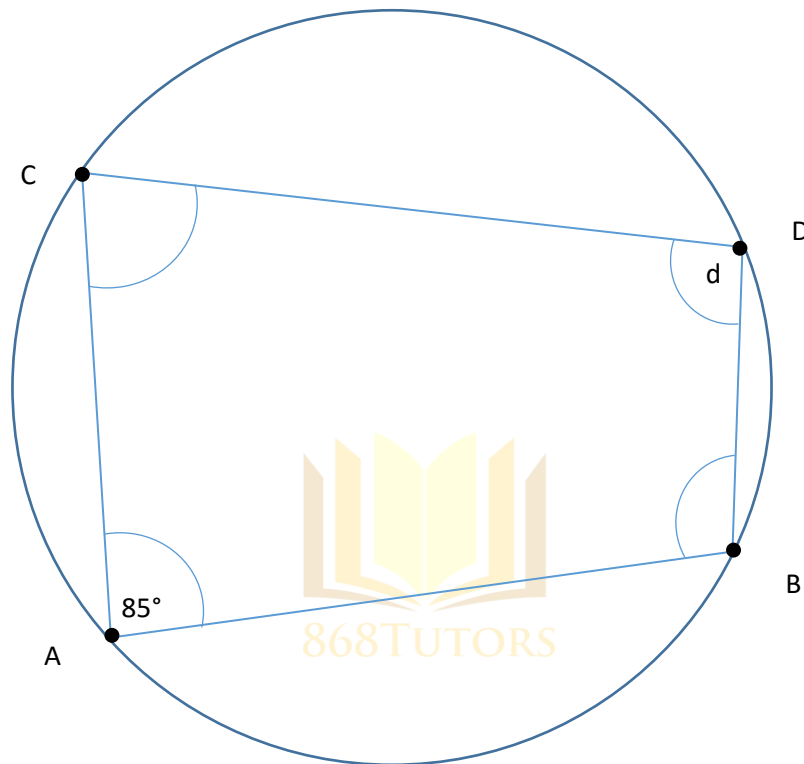**State the value of c and give a reason for your answer.**

*c = 180˚ - 80˚ **c = 100˚***

Reason: Opposite angles in a cyclic quadrilateral sum to 180°.

(2 marks)

Question 6

Consider the circle below:

State the value of d and give a reason for your answer.
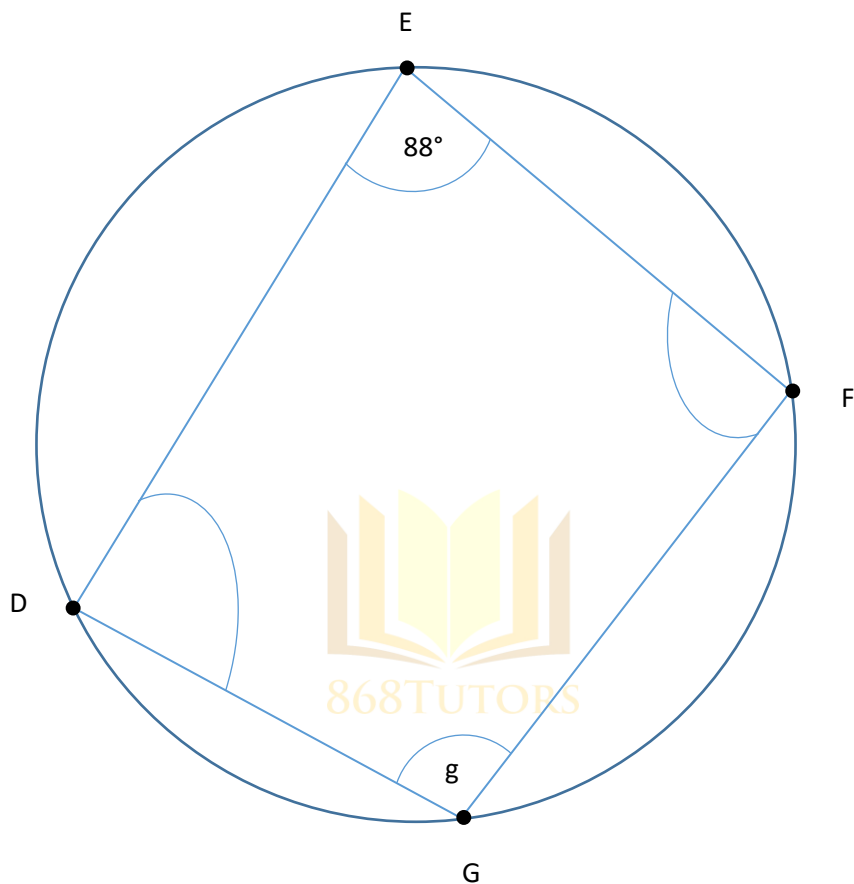
d = 180˚ - 85˚

d = 95˚

Reason: Opposite angles in a cyclic quadrilateral sum to 180˚.

(2 marks)

Question 7

Consider the circle below:

State the value of g and give a reason for your answer.

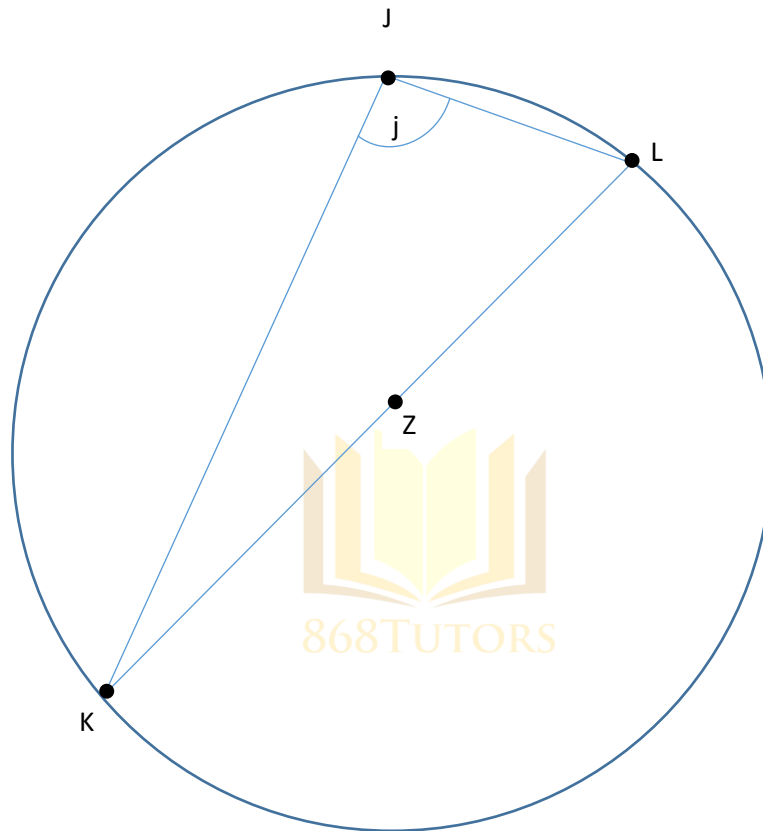*g = 180° - 88°*

g = 92˚

Reason: Opposite angles in a cyclic quadrilateral sum to 180°.

(2 marks)

Question 8

Consider the circle below with centre Z

Also, KL is a diameter of the circle below

State the value of j and give a reason for your answer.

j = 90˚

Reason: The angle in a semi-circle is = 90°.

(3 marks)

Question 9

Consider the circle below with centre D

Also, AB is a diameter of the circle below

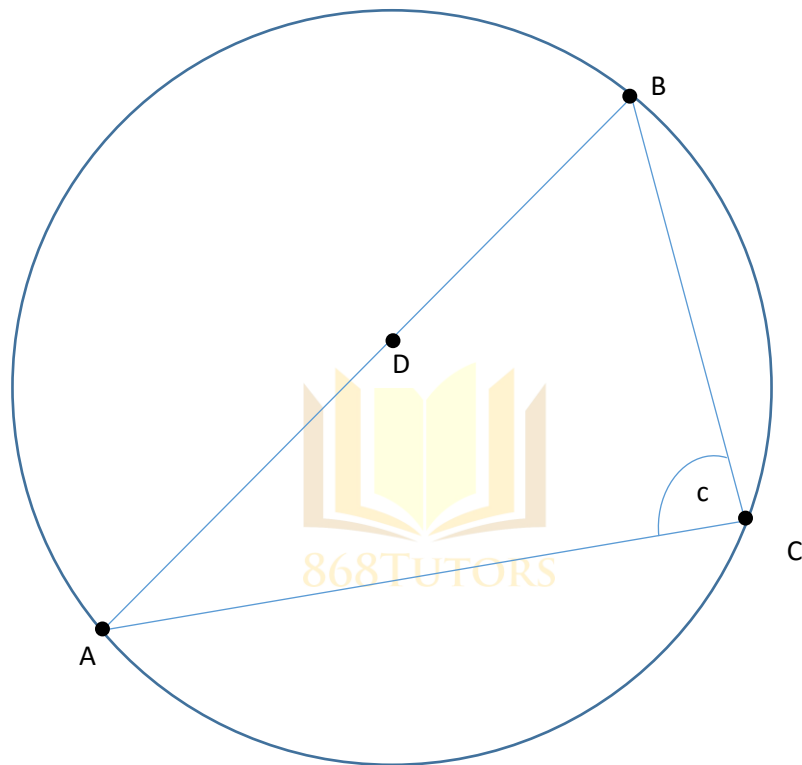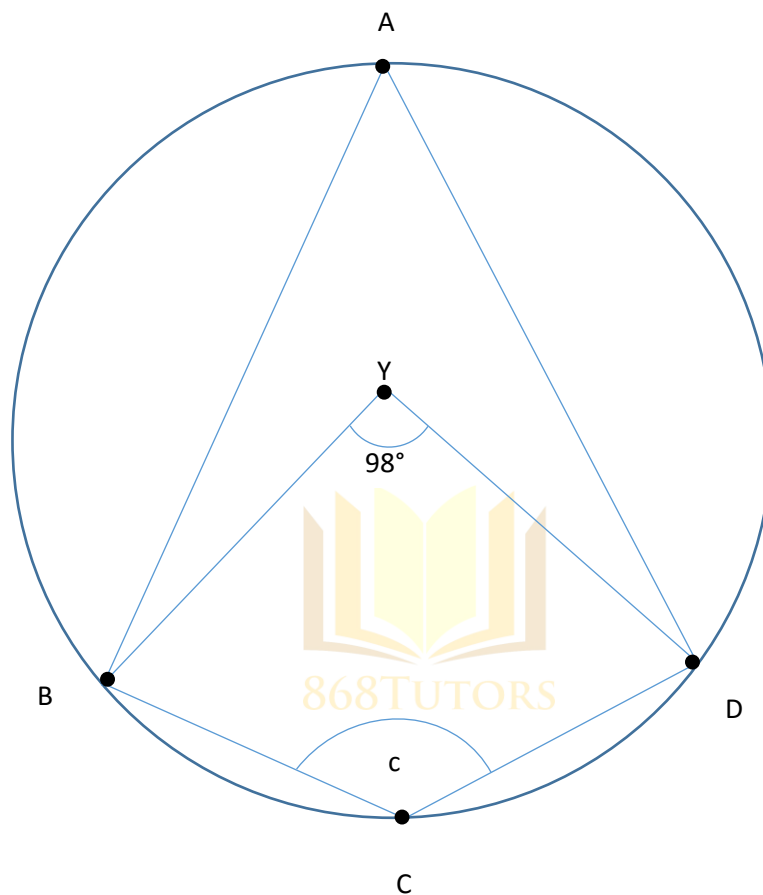

State the value of c and give a reason for your answer.

c = 90˚

Reason: The angle in a semi-circle is = 90º.

(4 marks)

Question 10

Consider the circle below with centre Y:

Determine the value of c and give reasons for your answer.

$< DAB = \frac{98^o}{2} = 49°$ *Reason: The angle at the centre is twice the angle at the circumference*

c = 180° - 49° (CBAD is a cyclic quadrilateral)

Reason: Opposite angles in a cyclic quadrilateral sum to 180°

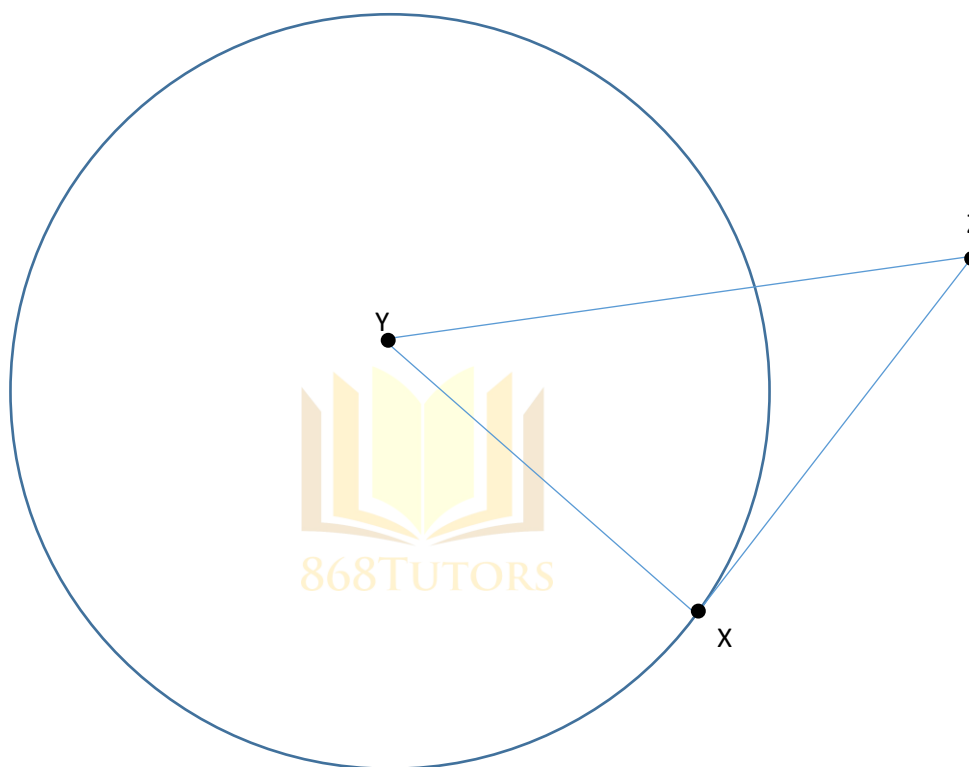**c = 131˚.**

(5 marks)

Question 11

Consider the circle below with centre Y
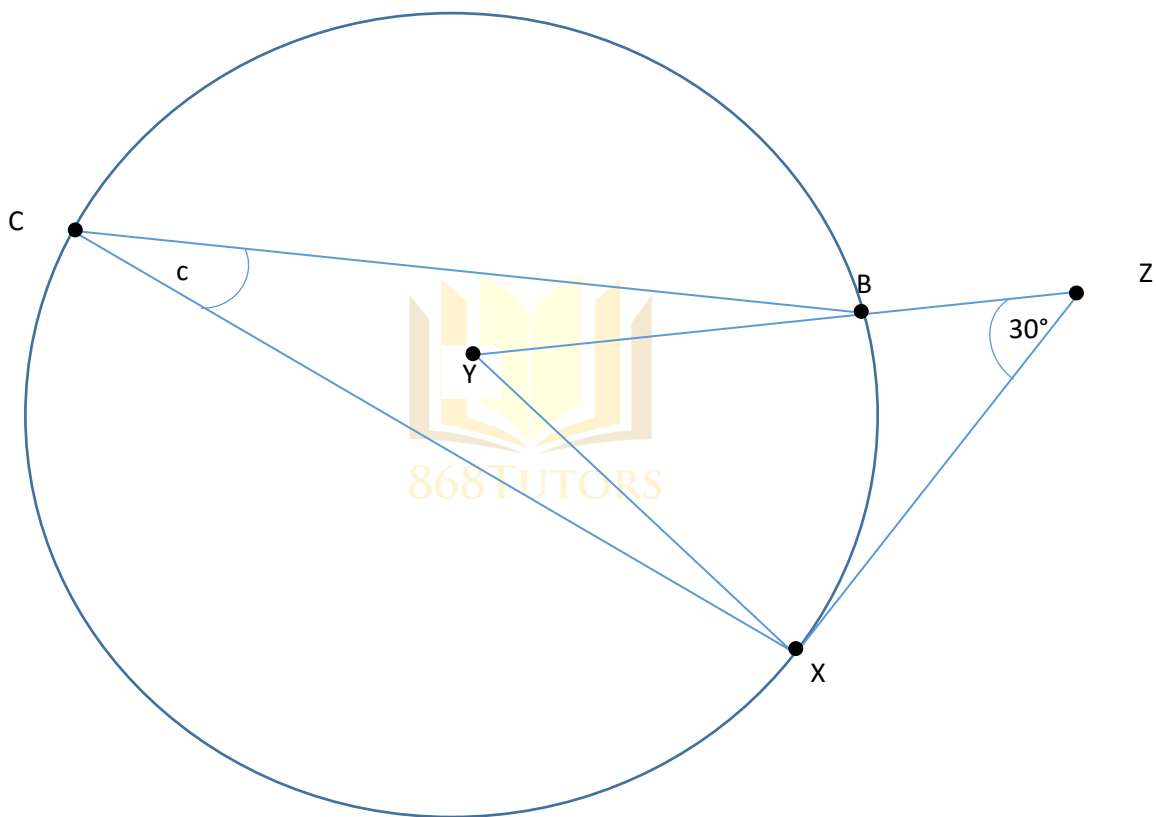
XZ is a circle tangent and XY is a circle radius

State the value of <YXZ and give a reason for your answer.

<YXZ = 90˚

The angle between a circle tangent and a circle radius = 90°.

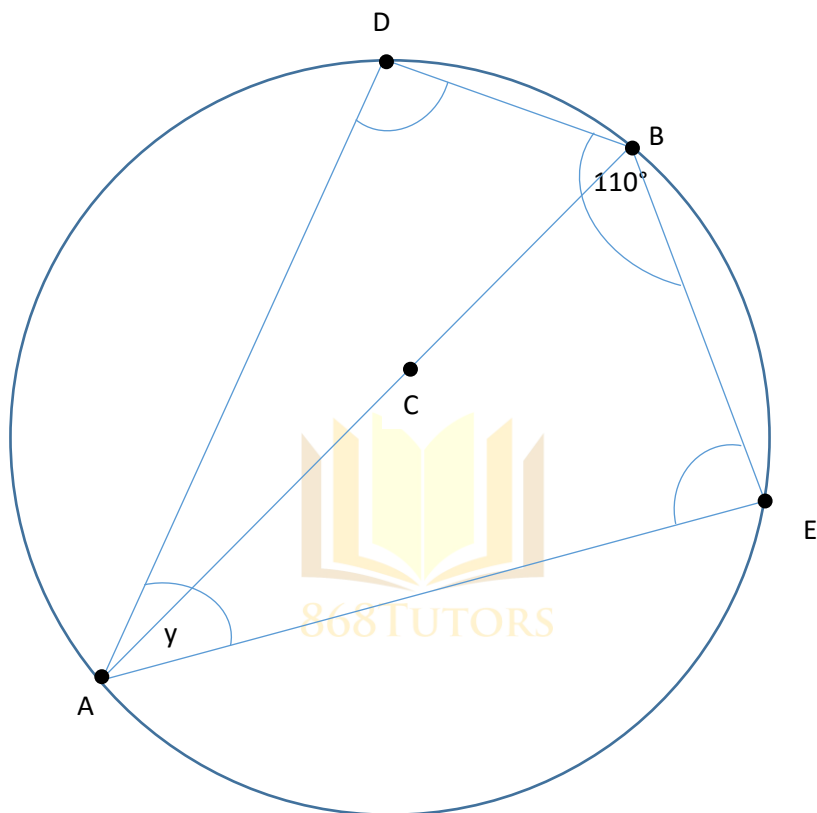**(3 marks)**

Question 12

Consider the circle below with centre Y

XZ is a circle tangent and XY is a circle radius

<XZY = 30°

Determine the value of c and give reasons for your answer.

<YXZ = 90° (Reason: The angle between a circle tangent and circle radius = 90°.)

<XYZ = 180° - (90° + 30°)

<XYZ = 180° - 120° = 60°   (Reason: Internal angles in a triangle sum to 180°.)

$C = \frac{60°}{2}$ **c = 30°** (Reason: The angle at the centre is twice the angle at the circumference.)

(3 marks)

Question 13

Consider the circle below with centre C

Also, AB is a diameter of the circle below

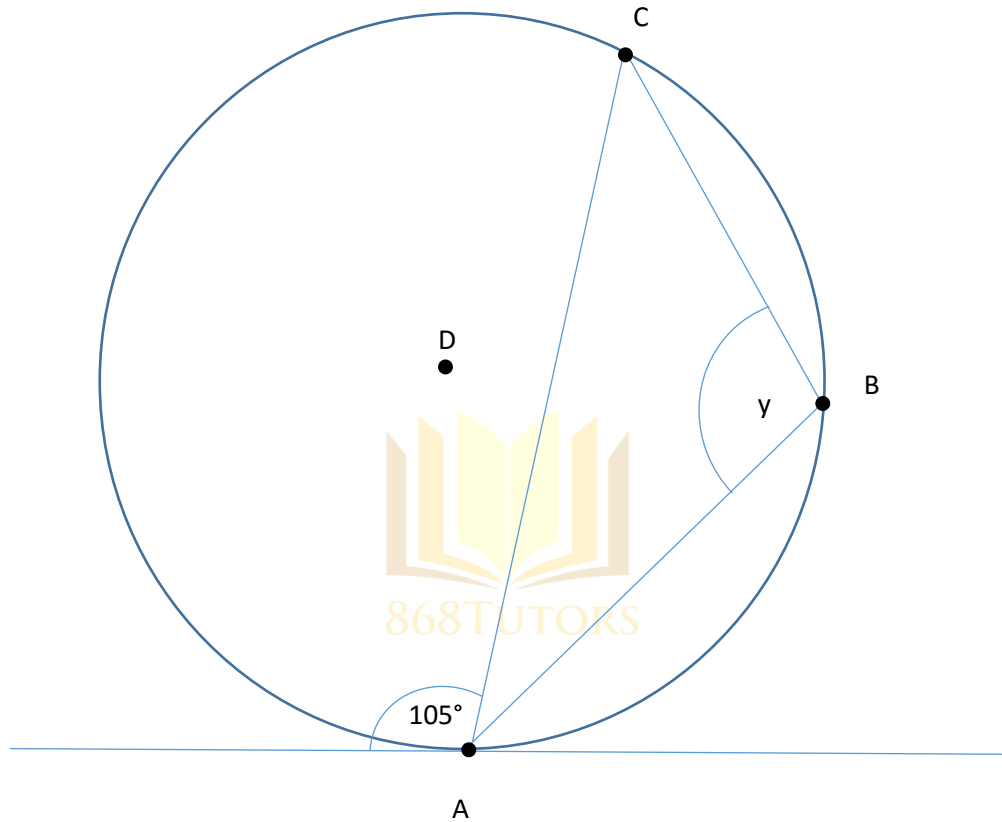**State the value of y and give a reason for your answer.**

y = 180˚ - 110°

y = 70°

(Reason: Opposite angles in a cyclic quadrilateral sum to 180˚.)

(6 marks)

Question 14

Consider the circle below with centre D

State the value of y and give a reason for your answer.
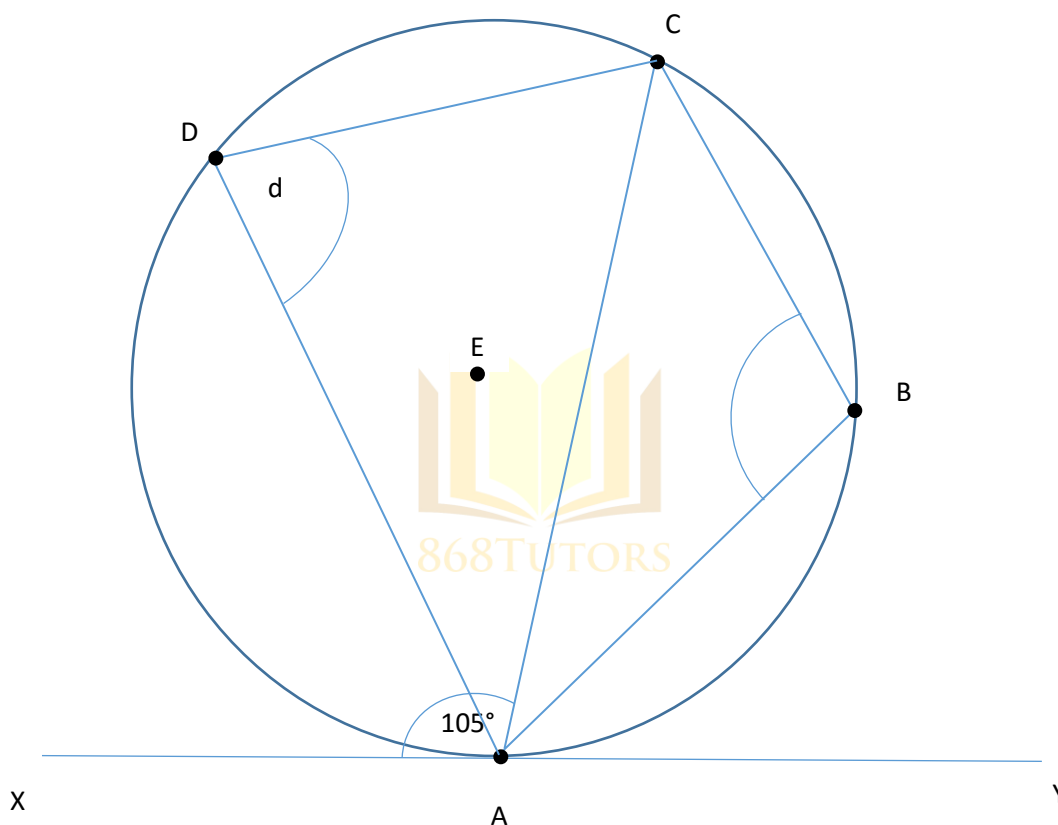
y = 105°

Reason: Alternate segment theorem

(3 marks)

Question 15

Consider the circle below with centre E

Line XY is a straight line that is tangent to the circle at point A

Determine the value of d and give reasons for your answer.

<ABC = 105˚ (Reason: Alternate Segment Theorem)

d = 180˚ - 105˚ **d = 75º** *(Reason: Opposite angles in a cyclic quadrilateral sum to 180˚.)*

(4 marks)

END OF WORKSHEET