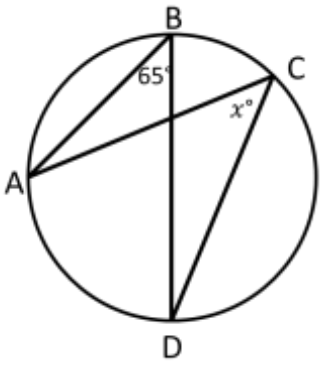
Circle theorems worksheet

Q1.

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



(a) Find the size of angle ACD

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

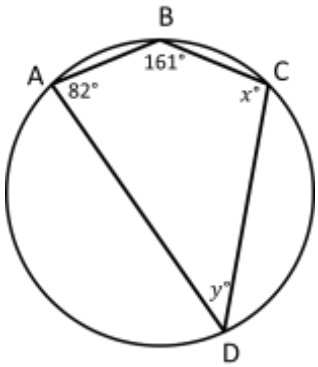
(b) Give a reason for your answer

.....

.....**[2]**

Q2.

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



(a) Find the size of angle x giving reasons for your answer.

.....

.....**[2]**

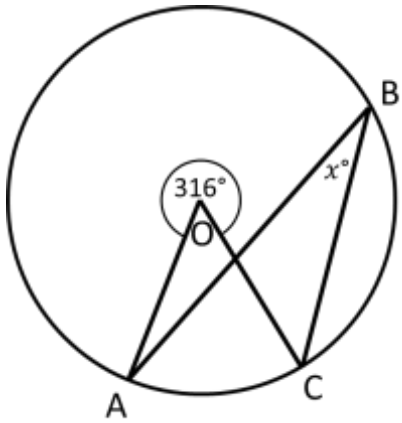
(a) Find the size of angle y giving reasons for your answer.

.....

.....**[2]**

Q3.

In the diagram, A, B, C are points on the circumference of a circle and O is the centre of the circle.



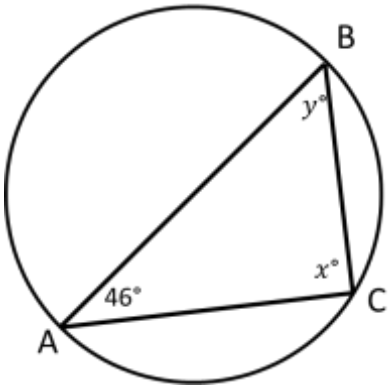
Find the size of angle ABC giving reasons for your answer.

……

……**[2]**

Q4.

In the diagram, A, B, C are points on the circumference of a circle and the line AB is the diameter.



(b) Find the size of angle x giving reasons for your answer.

……

……**[2]**

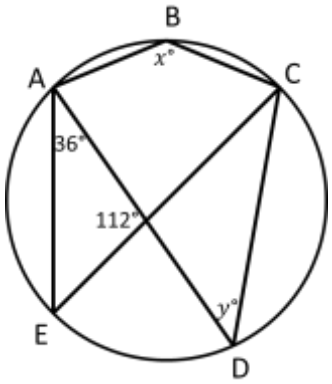
(b) Find the size of angle y giving reasons for your answer.

……

……**[2]**

Q5.

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



(a) Find the size of angle x giving reasons for your answer.

……

……**[2]**

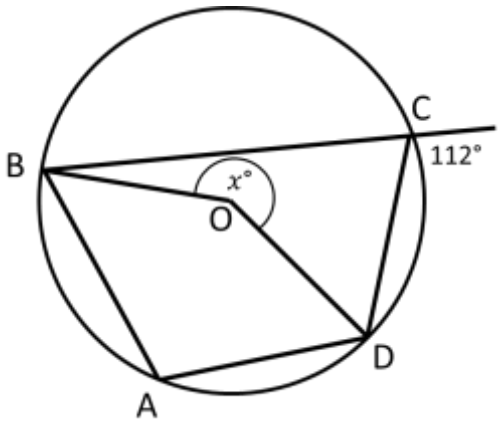
(b) Find the size of angle y giving reasons for your answer.

……

……**[2]**

Q6. AO2

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



Find the size of angle x giving reasons for your answer.

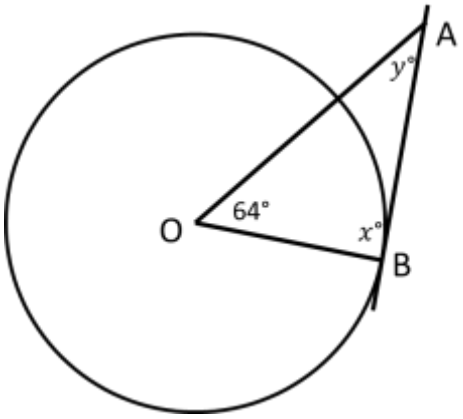
……

……

……**[2]**

Q7. AO2

B is a point on the circumference of the circle, O is the centre of the circle and the line AB is a tangent to the circle.



(a) Find the size of angle x

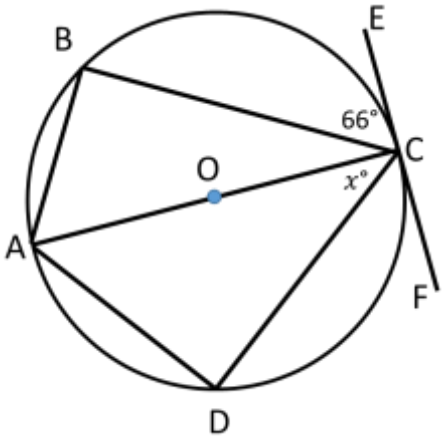
.....**[1]**

(b) Find the size of angle y

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

Q8. AO2

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

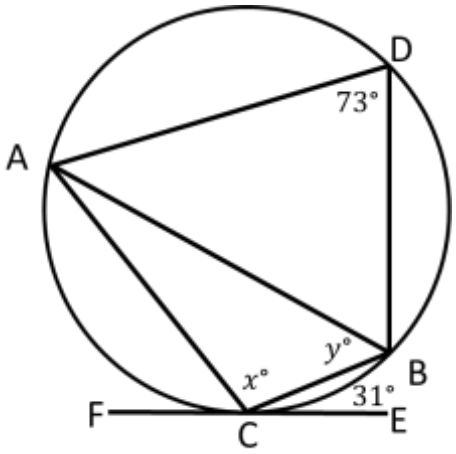


Given that the angle BAD has a value of $2x$, find the value of x.

……**[3]**

Q9. AO2

A, B, C and D are points on the circumference of a circle. The line EF is a tangent to the circle.



(a) Find the size of angle x

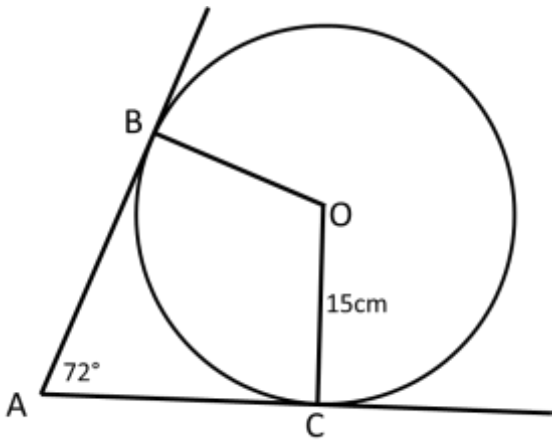
……**[2]**

(b) Find the size of angle y

……**[1]**

Q10. AO3

A, B *and* C are points on the circumference of a circle and O is the centre of the circle. The lines AB and AC are tangents to the circle is a tangent to the circle.



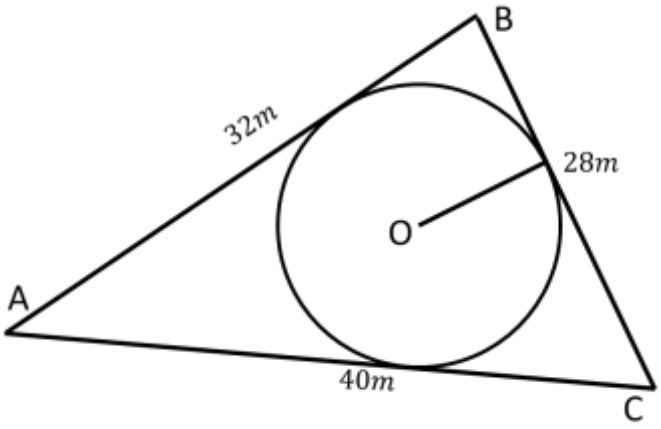
Calculate the length AO, giving your answer to 1 decimal place.

……**[4]**

Q11. AO3

The lines AB, BC and AC are tangents to the circle and O is the centre of the circle.

Given that the area of the triangle is 452.54m^2, find the radius of the circle to 1 decimal place.



……**[5]**

Answers

Q1.

$x = 65° - Angles\ in\ same\ segment\ are\ equal$

Q2.

$x = 98°$ and $y = 19°$

$Reasons\ include\ opposite\ angles\ in\ cyclic\ quadrilateral\ make\ 180°\ or\ angles\ in\ quad = 360°$

Q3.

$x = 22° - Angle\ at\ centre\ is\ twice\ angle\ at\ circumference$

Q4.

$x = 90° - Angles\ in\ semicircle\ is\ 90°$

$y = 44° - Angles\ in\ triangle$

Q5.

$x = 148° - Opposite\ angles\ in\ cyclic\ quadrilateral\ make\ 180\ degrees.$ (opposite y)

$y = 32° - AEC = 32\ degrees\ (angles\ in\ triangle)$

$then\ angles\ in\ same\ segment\ are\ equal\ (angle\ y)$

Q6.

$x = 224°$

$DCB = 68\ degrees, straight\ line = 180\ degrees$

$BAD = 112\ degrees, opposite\ angles\ in\ cyclic\ quadrilateral\ make\ 180\ degrees$

$x = 224\ degrees, angle\ at\ centre\ is\ twice\ angle\ at\ circumference.$

Q7.

$x = 90°, y = 26°$ (angle in semicircle is 90 degrees then angles in a triangle)

Q8.

$x = 52$

Q9.

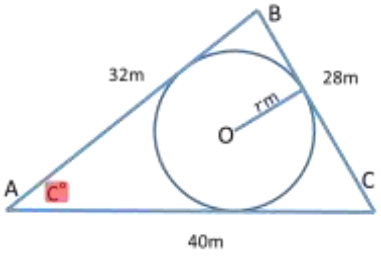
$x = 107°$

$y = 42°$

Q10.

$25.5cm$ $(make\ a\ kite\ and\ use\ trigonometry\ to\ find\ the\ hypotnenuse)$

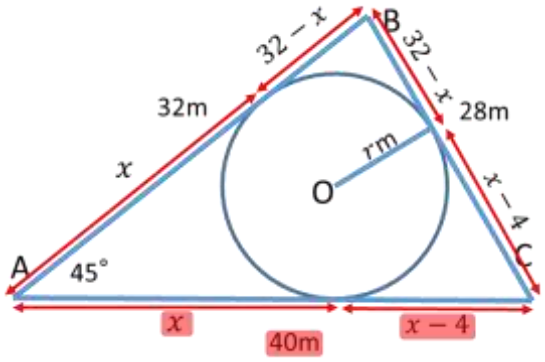
Q11.



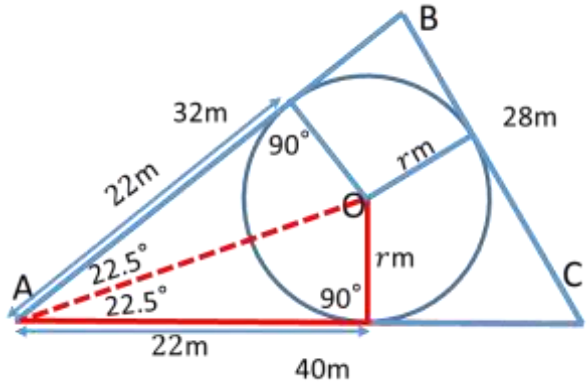
Area of a triangle

$$= \frac{1}{2} \times 32 \times 40 \sin C$$

$C = 45°$



$x = 22$



$22 \tan(22.5) = r$