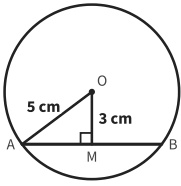


Circle Theorems: Chords

1 the line from O at 90° halves the chord

Find the length of the chord AB.

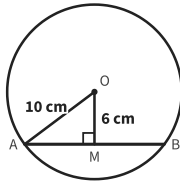


AM = cm Pythagoras: $\sqrt{5^2 - 3^2}$

$AB = 2 \times 4$

AB = cm

2 Find the length of the chord AB.

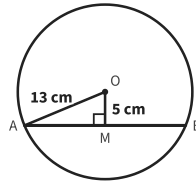


AM = cm Pythagoras: $\sqrt{10^2 - 6^2}$

$AB = 2 \times 8$

AB = cm

3 Find the length of the chord AB.

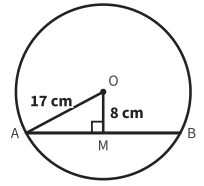


AM = cm Pythagoras: $\sqrt{13^2 - 5^2}$

$AB = 2 \times 12$

AB = cm

4 Find the length of the chord AB.



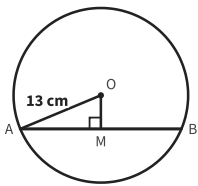
AM = cm Pythagoras: $\sqrt{17^2 - 8^2}$

$AB = 2 \times 15$

AB = cm

5 Notice the change!

AB = 24 cm. Find the distance OM.

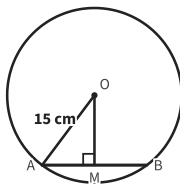


AM = cm OM cuts the chord in half

$OM = \sqrt{13^2 - 12^2}$

OM = cm

6 AB = 18 cm. Find the distance OM.

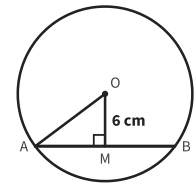


AM = cm OM cuts the chord in half

$OM = \sqrt{15^2 - 9^2}$

OM = cm

7 AB = 16 cm. Find the radius OA.

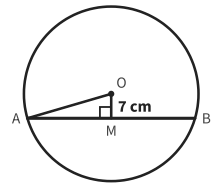


$AM = 16 \div 2 = 8$

$OA = \sqrt{8^2 + 6^2}$

OA = cm

8 AB = 48 cm. Find the radius OA.



$AM = 48 \div 2 = 24$

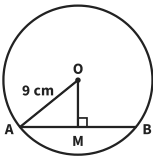
$OA = \sqrt{24^2 + 7^2}$

OA = cm

Circle Theorems: Chords further practice

9

O is the centre, AB = 14 cm and the radius is 9 cm. Find OM to 1 decimal place.



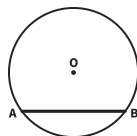
$AM = 7$ cm (OM cuts the chord in half)

$OM = \sqrt{9^2 - 7^2} = \sqrt{32}$

Answer $OM = 5.7$ cm

10

A round clock face has a radius of 15 cm. A straight crack AB across it is 24 cm long. How far is the crack from the centre O?



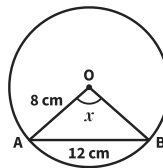
half the crack is 12 cm

$\sqrt{15^2 - 12^2} = \sqrt{81}$

Answer 9 cm

11

O is the centre. Find angle AOB, marked x , to 1 decimal place.



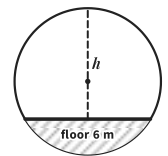
half of angle AOB: $\sin = 6 \div 8$

$x = 2 \times 48.59...$

Answer $x = 97.2^\circ$

12

A tunnel is a circle of radius 3.5 m with a flat floor 6 m wide. Find the height h of the tunnel to 1 decimal place.



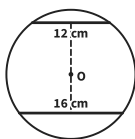
centre to floor: $\sqrt{3.5^2 - 3^2} = 1.80... m$

$h = 3.5 + 1.80...$

Answer 5.3 m

13

A circle has radius 10 cm. Two parallel chords, 12 cm and 16 cm long, are on opposite sides of the centre O. How far apart are the chords?



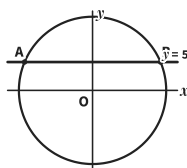
$\sqrt{10^2 - 6^2} = 8$ and $\sqrt{10^2 - 8^2} = 6$

$8 + 6$

Answer 14 cm

14

A circle has centre O (0, 0) and radius 13. The line $y = 5$ cuts the circle at A and B. Find the length AB.



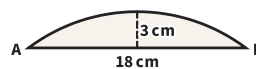
the line is 5 from O, so half of AB is $\sqrt{13^2 - 5^2} = 12$

$A = (-12, 5), B = (12, 5)$

Answer $AB = 24$

15

A piece of a broken round plate is found. Its straight broken edge AB is 18 cm long. The greatest distance from AB to the curved rim is 3 cm. Find the radius of the plate.



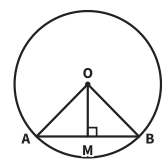
$r^2 = 9^2 + (r - 3)^2$

$0 = 81 - 6r + 9$, so $6r = 90$

Answer 15 cm

16

OM is perpendicular to the chord AB. Explain why M is the midpoint of AB.



$OA = OB$ (radii), OM is shared, both angles at M are 90°

so triangles OAM and OBM are congruent (RHS)

$AM = MB$

So