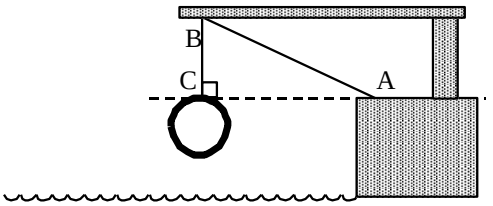
1 **What is the equation of the circle** which is centered at C$(-2,\ 3)$ and whose radius is $r = \sqrt{2}$?

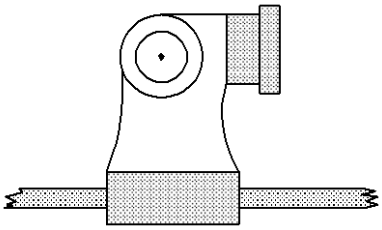
2 A race car test track is in the shape of a circle with centre $(-5,\ 3)$ on a coordinate plane. A race car passes through point $(3,\ -1)$. **What equation describes this circular race track**?

3 **What is the equation of the circle** $x^2 + y^2 - 6x - 8y - 9 = 0$ **in standard form**?.

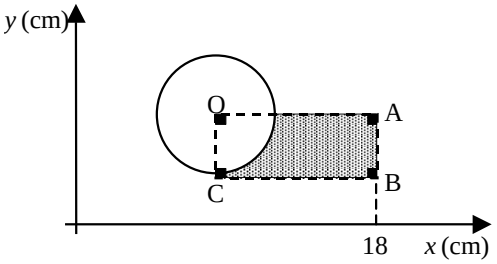
4 To build the set for a seal show, a hoop 1 metre in diameter is attached to a metal cable as illustrated on the right. The cable is attached to the pier at A. It goes through a hook at B and is attached to the hoop at C. Triangle ABC is right angled at C, and angle ABC measures 60°. The total length of the cable (from A to B to C) is 18 m. In a Cartesian plane, the *x*-axis passes through $\overline{CA}$ and point A is at the origin.
What is the equation of the circle representing the hoop?



5 The drawing at the right was prepared by an architect. It includes two concentric circles whose radii differ by 8 cm. In a Cartesian coordinate system, the equation of the larger circle is: $x^2 + y^2 - 12x - 16y - 44 = 0$
In the same Cartesian plane, **what is the equation of the smaller circle**?



6 A handyman drew the blueprint for a room in a Cartesian plane marked in centimetres. The equation of circle with centre O is
$x^2 + y^2 - 20x - 16y + 139 = 0$.
The abscissa of points A and B in rectangle OABC is 18.
What is the area of the shaded part?

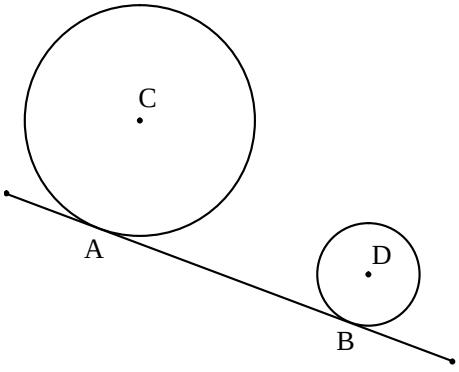


7 Two circles, centred at points C and D, are tangent to a straight line segment, at points A and B, respectively, as illustrated in the diagram below. These circles are defined by the rules:

Circle C: $(x + 3)^2 + (y - 2)^2 = 16$

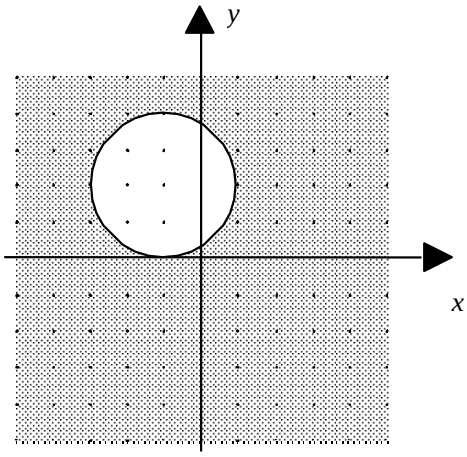
Circle D: $(x - 5)^2 + (y + 2)^2 = 4$

What is the distance, in units, between tangent points A and B?



(Drawing is not to scale)

8 **What inequality can be used to represent the shaded area shown here**?



1

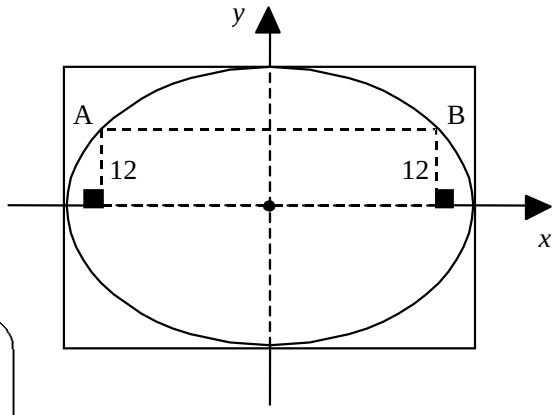
A lake has the shape of an ellipse defined by the equation $\frac{x^2}{100} + \frac{y^2}{676} = 1$ in which all distances are in metres.

A buoy was been placed at each focus of the ellipse formed by this lake. **What is the distance between the buoys**?

2

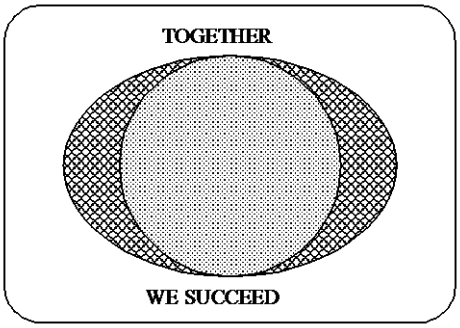
Miriam made the following poster for sports week at her school. She has drawn an ellipse to represent a football. The equation of this ellipse is $\frac{x^2}{289} + \frac{y^2}{196} = 1$, where the measures are in centimetres.

Points A and B are at a distance of 12 cm from the major axis. **What is the length**, in centimetres, **of segment AB**?



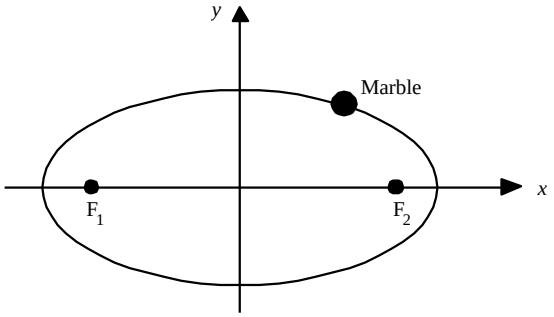
3

A group has selected the logo shown here. In a Cartesian plane, the equation of the circle is $x^2 + y^2 = 16$ and the foci of the ellipse are the two points where the circle intersects the *x*-axis. The two points common to the circle and the ellipse are located on the *y*-axis. **What is the length of the major axis of the ellipse**?



4

The trajectory of a moving marble is an ellipse with centre at the origin. The sum of the distances from the marble to F_1 and from the marble to F_2 is 20 cm. The length of the minor axis is 12 cm. **What is the equation of the ellipse**?



5

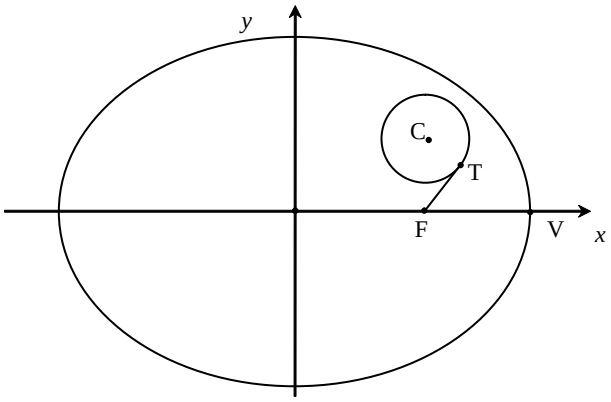
In the diagram, below right, the equation of the ellipse is $\frac{x^2}{625} + \frac{y^2}{400} = 1$. The circle has a radius of 3 m.

The centre C of the circle is located directly above the focus F of the ellipse.

Line segment FT is tangent to the circle at point T.

m $\overline{FT}$ = 4 m. All unit measures are in metres.

What is the equation of the circle?



(The diagram is not drawn to scale.)