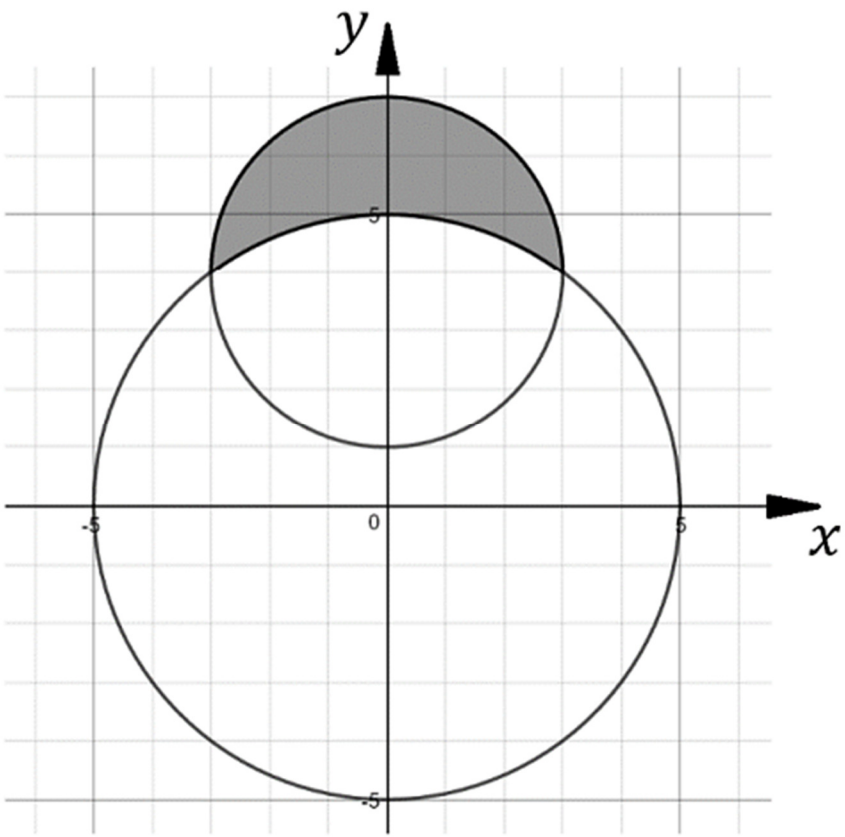


The diagram shows two circles on a centimetre square grid.

One circle has a radius of 5 cm and centre (0,0).

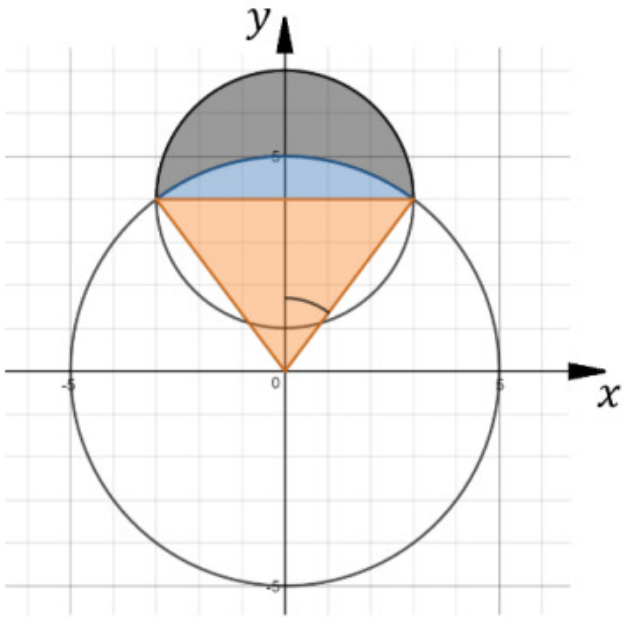
The other circle has radius 3 cm and centre (0,4).

The two circles intersect at the points (3,4) and (-3,4).

Find the area of the shaded shape.

Ans: 10.05

Solution



The area of the orange triangle is $\frac{6\times4}{2} = 12$ cm^2.

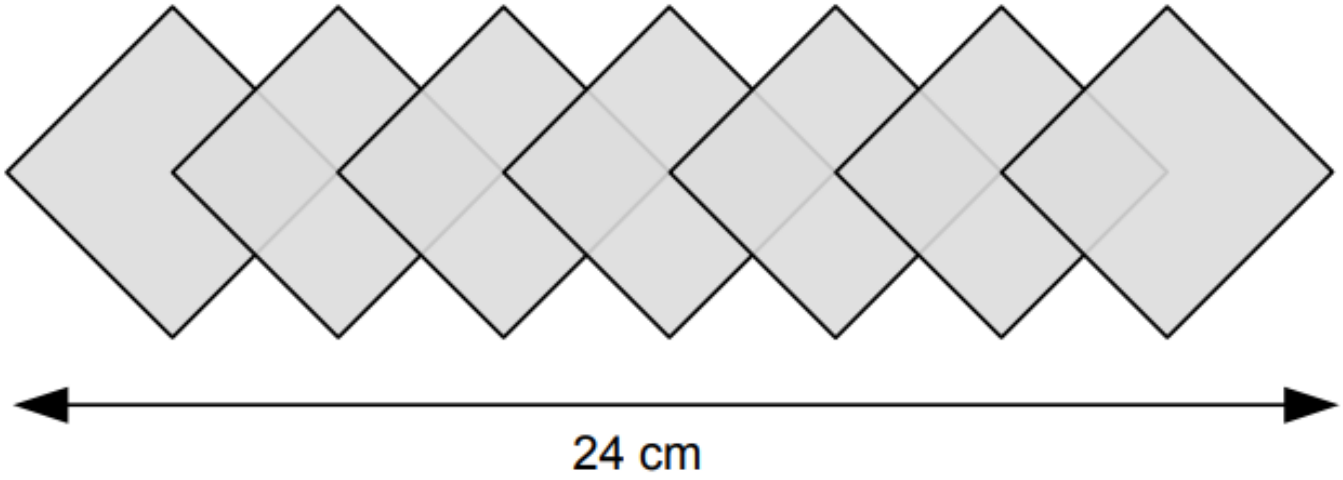
The angle indicated in the diagram is $\tan^{-1}\left(\frac{3}{4}\right) = 36.869..°$

The sector angle is $2 \times 36.869..° = 73.739..°$

The area of the sector is $\frac{73.739..°}{360} \times \pi \times 5^2 = 16.087..$ cm^2.

The area of the segment (in blue) is
the sector area – the triangle area
$= 16.087.. - 12 = 4.087..$ cm^2.

The required area is
the area of a semi-circle – the area of the segment
$= \frac{1}{2} \times \pi \times 3^2 - 4.087..$
$= 10.04$ cm^2 correct to 4 significant figures.



Not to scale

Seven identical squares are arranged in a row to form a design as shown.

Adjacent squares overlap such that a corner of each one is at the middle of the other square.

The width of the design is 24 cm.

Work out the area of the design.

Ans: 99