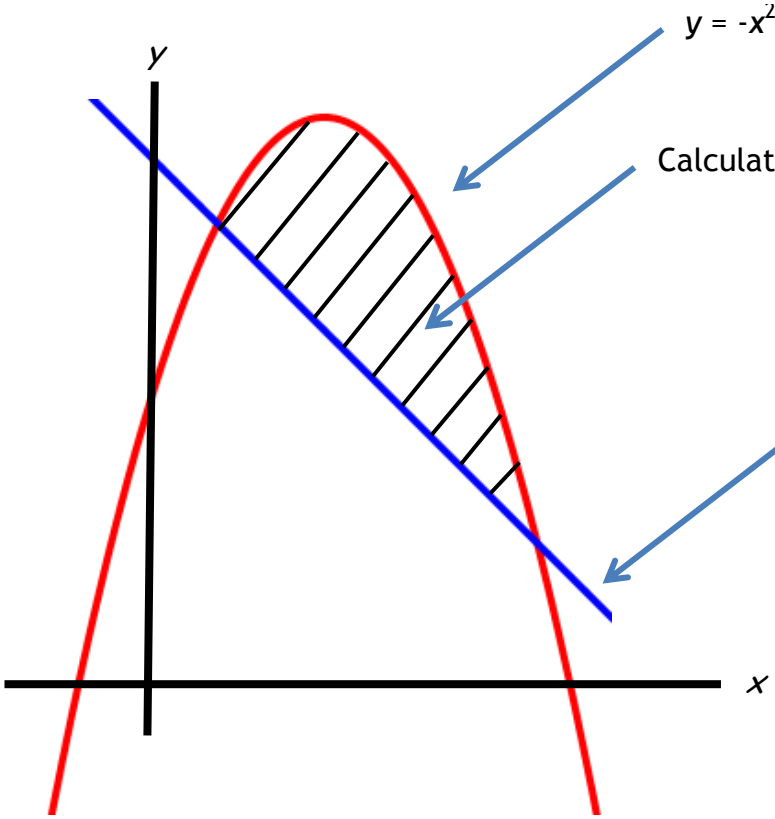
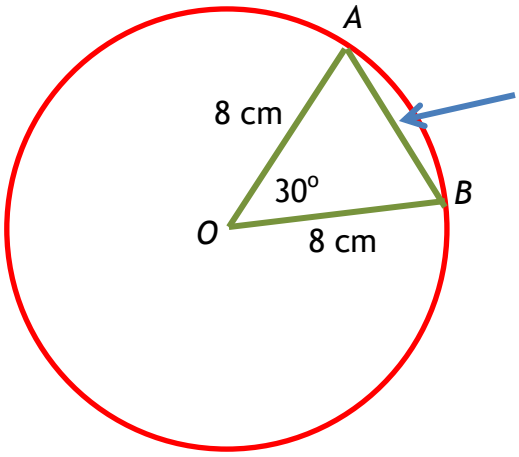
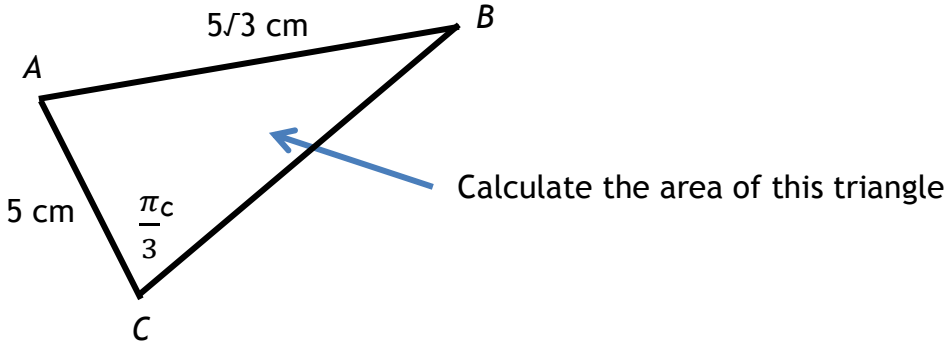

y
x
y = -x² + 4x + 5
Calculate the shaded area
y = -x + 9


A
8 cm
30°
B
O
8 cm
Calculate the segment area if
O is the centre of the circle of
radius 8 cm


5√3 cm
B
A
5 cm
πc/3
C
Calculate the area of this triangle

Solutions

The line intercepts the curve at (1, 8) and (4, 5)

Shaded area = $\int_1^4(-x^2+4x+5)dx-\left(\frac{8+5}{2}\right)\times 3=24-\frac{39}{2}=\frac{9}{2}$ square units

---

Segment area = $\frac{1}{2}\times 8^2\times\frac{\pi}{6}-\frac{1}{2}\times 8^2\times\sin\left(\frac{\pi}{6}\right)=32\left(\frac{\pi}{6}-\frac{1}{2}\right)\ cm^2$

BC = 10 cm [cosine rule]

Triangle area = $\frac{1}{2}\times 5\times 10\times\sin\left(\frac{\pi}{3}\right)=\frac{25\sqrt{3}}{2}\ cm^2$

Alternatively, angle *ABC* = $\frac{\pi}{6}$ by the sine rule and therefore angle *BAC* = $\frac{\pi}{2}$ and since the triangle is right-angled, the area is $\frac{1}{2}\times 5\times 5\sqrt{3}=\frac{25\sqrt{3}}{2}\ cm^2$