

Geometry- Notes to find the area of a segment

w17d4
Key

How could you find the area of the green segment?

Green

120°

6 cm

Drag the green segment to reveal the sector.

What dimensions do you need to solve the problem?

∠ of sector, radius, base + height of Δ

6√3

3

60°

3√3

6

Area of segment = area of sector - area of Δ.

Breaking it down to the two parts

Calculate the dimensions of the triangle

Given:

6 cm

6√3

3

60°

30°

6 cm

area of sector
 $\frac{120^\circ}{360^\circ} = \pi \cdot 6^2$

area of Δ
 $\frac{1}{2} \cdot 6\sqrt{3} \cdot 3$

Calculate the areas

6 cm

3 cm

60°

30°

6 cm

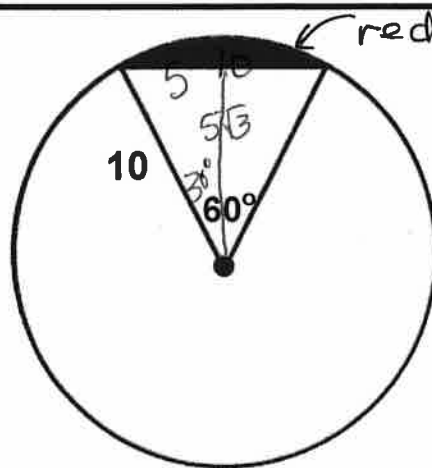
5.196 cm

$A_s = 37.6991$

$A_\Delta = 9\sqrt{3}$

Area of segment = $37.6991 - 9\sqrt{3} = 22.1 \text{ cm}^2$

Find the area of the segment shaded red



$$\begin{aligned}\text{Area of sector} &= \frac{60^\circ}{360^\circ} \cdot \pi \cdot 10^2 \\ &= 52.3599\end{aligned}$$

$$\begin{aligned}\text{Area of triangle} &= \frac{1}{2}(10)(5\sqrt{3}) \\ &= 5 \cdot 5\sqrt{3} \\ &= 25\sqrt{3}\end{aligned}$$

HINT

$$\text{Area of segment} = 52.3599 - 25\sqrt{3} \approx 9.1 \text{ u}^2$$