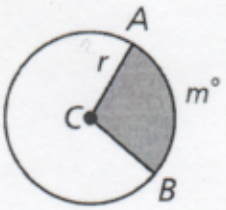
KEY

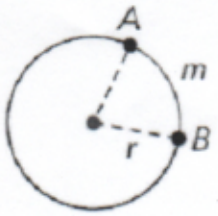
Geometry: 11-3 Notes

Area of a sector of a circle:



$\left(\frac{m\angle}{360}\right)(\pi r^2)$

Arc length:



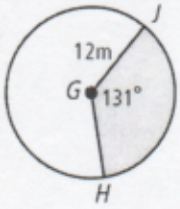
$\left(\frac{m\angle}{360}\right)(2\pi r)$

Area of a Segment of a circle:

area of segment = area of sector − area of triangle

Examples:

1. Find the area of sector HGJ. Give answers in terms of π and rounded to the nearest hundredth.



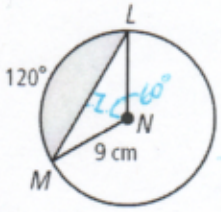
$A=\left(\frac{m\angle}{360}\right)(\pi r^2)$

$=\left(\frac{131}{360}\right)(\pi(12)^2)$

$=52.4\pi\ m^2$

OR $\approx 164.62\ m^2$

2. Find the area of segment LNM in simplest form and round to the nearest hundredth.

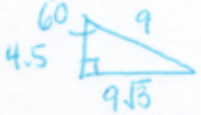


$A_{sector\ LNM}=\left(\frac{120}{360}\right)(\pi(9)^2)$

$=27\pi\ cm^2$

$A_{\triangle LNM}=\frac{1}{2}(9\sqrt{3})(4.5)$

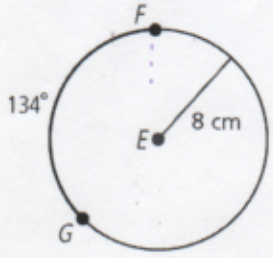
$=20.25\sqrt{3}\ cm^2$



$A_{segment\ LNM}=27\pi-20.25\sqrt{3}$

$\approx 49.75\ cm^2$

3. Find the length of arc FG. Give answers in terms of π and rounded to the nearest hundredth.



$L_{\hat{FG}}=\left(\frac{m\angle}{360}\right)(2\pi r)$

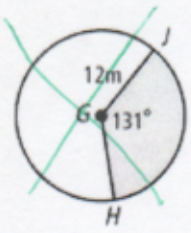
$=\left(\frac{134}{360}\right)(2\pi 8)$

$=5.96\pi$ cm

≈ 18.71 cm

Group Work Examples:

1) Find the area of sector ~~HGJ~~ RST

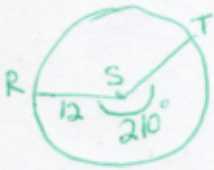


$A = \left(\frac{m\angle}{360}\right)(\pi r^2)$

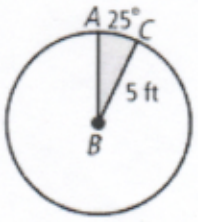
$= \left(\frac{210}{360}\right)(\pi 12^2)$

$= 84\pi \text{ in}^2$

$\approx 263.89 \text{ in}^2$



2) Find the area of sector ABC.



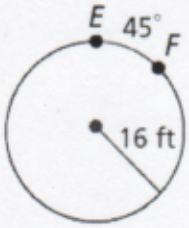
$A = \left(\frac{m\angle}{360}\right)(\pi r^2)$

$= \left(\frac{25}{360}\right)(\pi 5^2)$

$\approx 1.74\pi \text{ ft}^2$

$\approx 5.45 \text{ ft}^2$ or 5.47 ft^2

3) Find the length of $\overset{\frown}{EF}$.



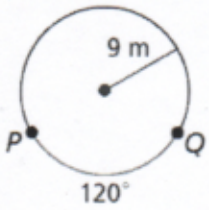
$L = \left(\frac{m\angle}{360}\right)(2\pi r)$

$= \left(\frac{45}{360}\right)(2\pi 16)$

$= 4\pi \text{ ft}$

$\approx 12.57 \text{ ft.}$

4) Find the length of $\overset{\frown}{PQ}$.



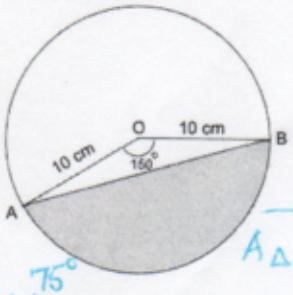
$L = \left(\frac{m\angle}{360}\right)(2\pi r)$

$= \left(\frac{120}{360}\right)(2\pi 9)$

$= 6\pi \text{ m}$

$\approx 18.85 \text{ m}$

5) Find the area of segment AOB in simplest form and round to the nearest hundredth.



$A_{sector} = \left(\frac{150}{360}\right)(\pi 10^2)$

$\approx 41.67\pi \text{ cm}^2$

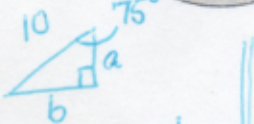
$\approx 130.9 \text{ cm}^2$

$A_{\triangle} = \frac{1}{2}(19.32)(2.59)$

$\approx 25.02 \text{ cm}^2$

$A_{segment} = 130.9 - 25.02$

$= 105.88 \text{ cm}^2$



$\sin 75 = \frac{b}{10}$

$b \approx 9.66$

$\cos 75 = \frac{a}{10}$

$a \approx 2.59$

$AB \approx 19.32$

6) Find the area of the shaded segment in simplest form And round to the nearest hundredth.

$A_{sector} = \left(\frac{60}{360}\right)(\pi 10^2)$

$\approx 16.67\pi \text{ UNITS}^2$

$\approx 52.36 \text{ UNITS}^2$

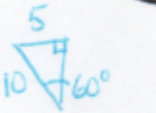
$A_{\triangle} = \frac{1}{2}(10)(5\sqrt{3})$

$= 25\sqrt{3} \text{ UNITS}^2$

$\approx 43.3 \text{ UNITS}^2$

$A_{segment} = 52.36 - 43.3$

$= 9.06 \text{ UNITS}^2$



$h = 5\sqrt{3}$