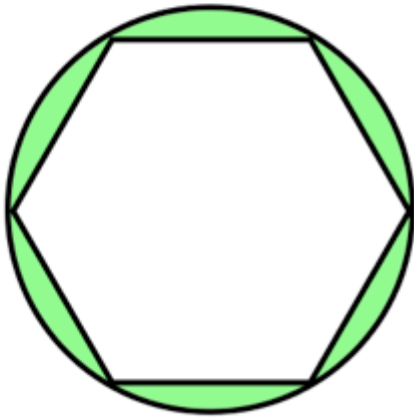


November 25th

The area of the shaded region is  $72\pi - 108\sqrt{3}$

Find the area of the regular hexagon.



If radius of the circle is  $r$ :

$$\text{Area of circle} = \pi r^2$$

$$\text{Area of hexagon} = 6 \times \frac{1}{2} \times r \times r \times \sin 60 = \frac{3\sqrt{3}}{2} r^2$$

$$\therefore \pi r^2 - \frac{3\sqrt{3}}{2} r^2 = 72\pi - 108\sqrt{3}$$

$$\text{Giving } r^2 = 72$$

$$\text{Area of hexagon} = \frac{3\sqrt{3}}{2} \times 72 = \mathbf{108\sqrt{3}}$$