

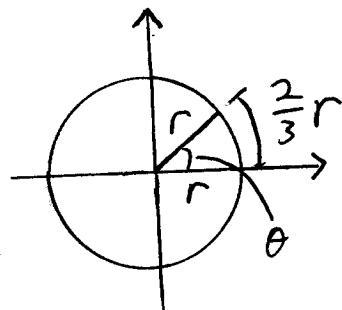
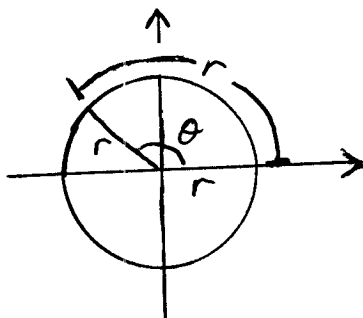
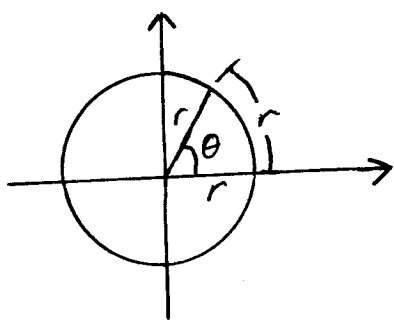
Math 12
Vogler

Radian Measure

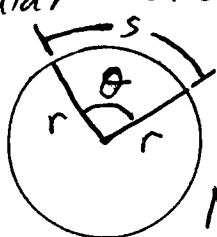
Defn An angle of 1 radian (rad.) is the angle θ determined by a circular arc whose length is equal to that of the radius of the circle: $\theta = 1 \text{ radian}$

$$\theta = 2 \text{ radians}$$

$$\theta = \frac{2}{3} \text{ radians}$$



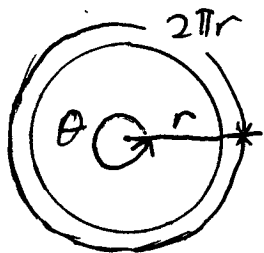
Fact! The radian measure of θ determined by circular arc of length s on a circle of radius r is



$$\theta = \frac{s}{r}$$

Note: Arc length s becomes $s = r\theta$.

Recall! The circumference of a circle is $C = 2\pi r$
 $\Rightarrow$ The total number of radians in a circle are



$$\theta = \frac{s}{r} = \frac{2\pi r}{r} = 2\pi \text{ radians}$$

which leads to the following facts:

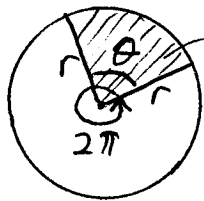
Facts: 1) $2\pi \text{ rads} = 360^\circ$

2) $\pi \text{ rads} = 180^\circ \Leftrightarrow \frac{\pi \text{ rads}}{180^\circ} = 1$ or $1 = \frac{180^\circ}{\pi \text{ rads}}$

3) $\frac{\pi}{180} \text{ rads} = 1^\circ$

4) $1 \text{ rad} = \left(\frac{180}{\pi}\right)^\circ \approx 57.3^\circ$

Fact: If θ is in radians $\Rightarrow$ the area of its corresponding sector is



$$A = \frac{\theta}{2\pi} \pi r^2 \Rightarrow$$

$$A = \frac{1}{2} \theta r^2$$