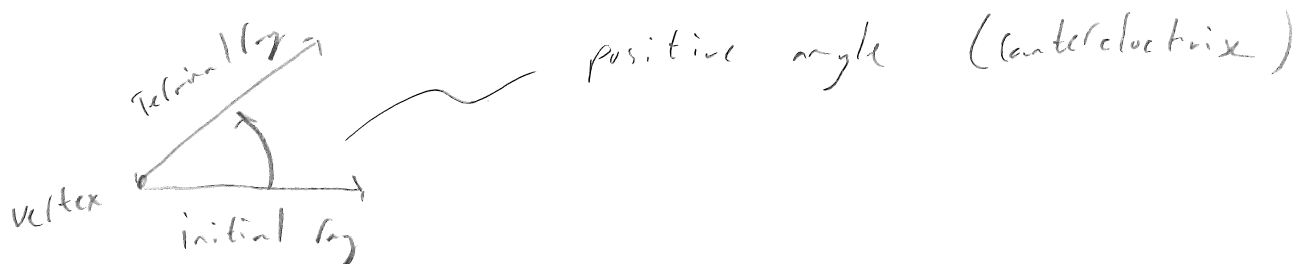


# 6C.1 Angles

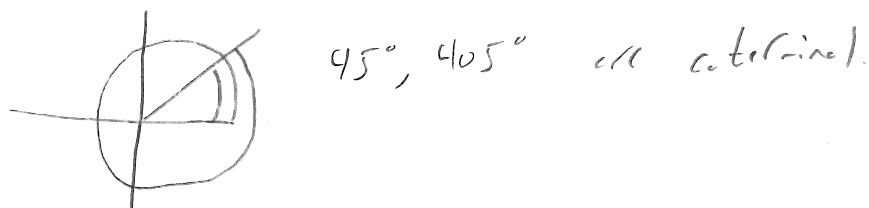
6C.1



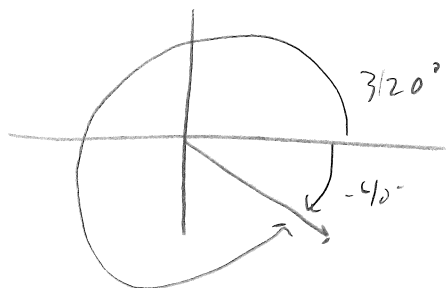
How to measure?

Degrees -  $360^\circ$  in a circle

If two angles have the same initial and terminal rays, then they are called coterminal



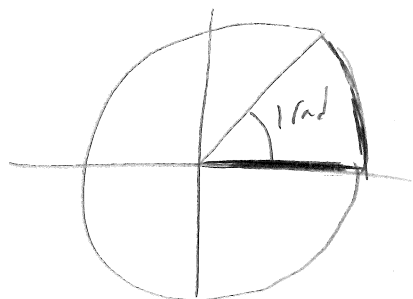
In general,  $0 + n(360)$  are coterminal  
for all integer  $n$ .



# Radians

6C.1

Angle of 1 radian is equal to the arc  
the same length as the radius



There are  $2\pi$  radians in a circle.

$$360^\circ = 2\pi \text{ radians}$$

To convert between radians and degrees:

$$\text{deg} = (\text{rad}) \frac{180}{\pi}$$

$$\text{rad} = (\text{deg}) \frac{\pi}{180}$$

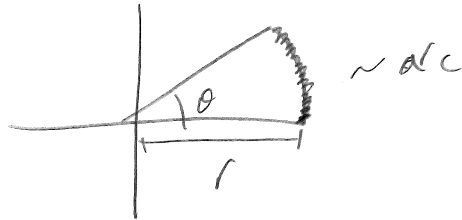
[Ex]

$$\frac{\pi}{6} \text{ radians} = 30^\circ$$

$$\text{because } \left(\frac{\pi}{6}\right) \left(\frac{180}{\pi}\right) = \frac{180}{6} = 30$$

## Arc length and area

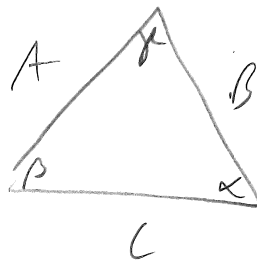
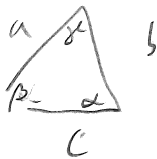
$$\text{Arc length} = r\theta$$



Area of this sector/wedge (i.e. area subtended)

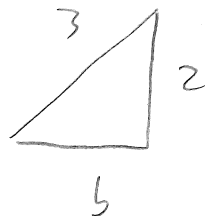
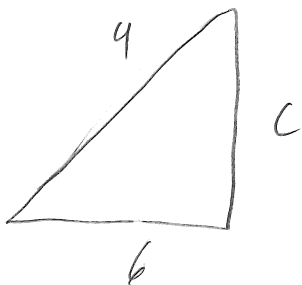
$$= \frac{\theta r^2}{2}$$

Def] similar triangles are pairs of triangles for which the angles are the same



$$\frac{a}{A} = \frac{b}{B} = \frac{c}{C}$$

Ex]

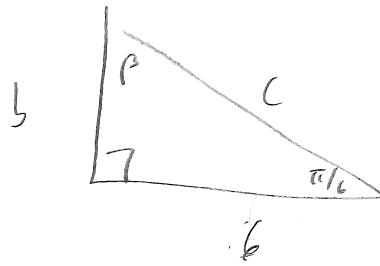
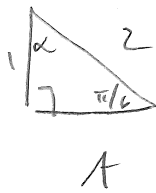


$$\frac{9}{3} = \frac{c}{2} \rightarrow c = 6$$

$$\frac{6}{b} = \frac{9}{3} \rightarrow b = 2$$

Sum of angles of a triangle is  $\pi$  radians /  $180^\circ$ . 66.1

Ex]



$$\alpha + \frac{\pi}{6} + \frac{\pi}{2} = \pi \rightarrow \alpha = \frac{\pi}{3} \quad (= \beta)$$

By pythagorean theorem:  $2^2 = 1^2 + A^2 \rightarrow A = \sqrt{3}$

Since angles are the same, triangles are similar.

$$\text{So, } \frac{b}{1} = \frac{6}{A} \rightarrow b = \frac{6}{\sqrt{3}}$$

$$\frac{C}{2} = \frac{6}{A} \rightarrow C = \frac{12}{\sqrt{3}}$$

Ex] Directions on a map

