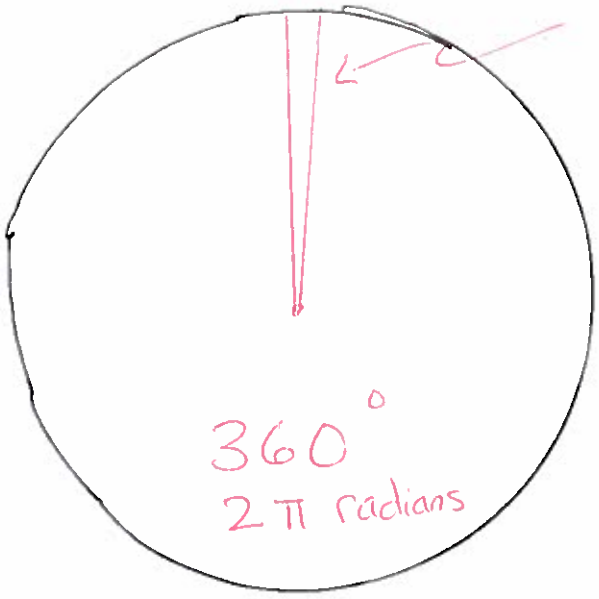
ASTR 250



Every 1° has
$60'$ ← arcminutes

Every $1'$ has
$60''$ ← arcseconds

In astronomy, we are often dealing with small angles on the sky - therefore we need subdivisions of a degree.

NOTATION: $10^\circ\ 45'\ 12.2''$

NOTE the SI prefixes may be used (especially with arcseconds):

mas = milli-arcseconds = 10^{-3} of an arcsecond

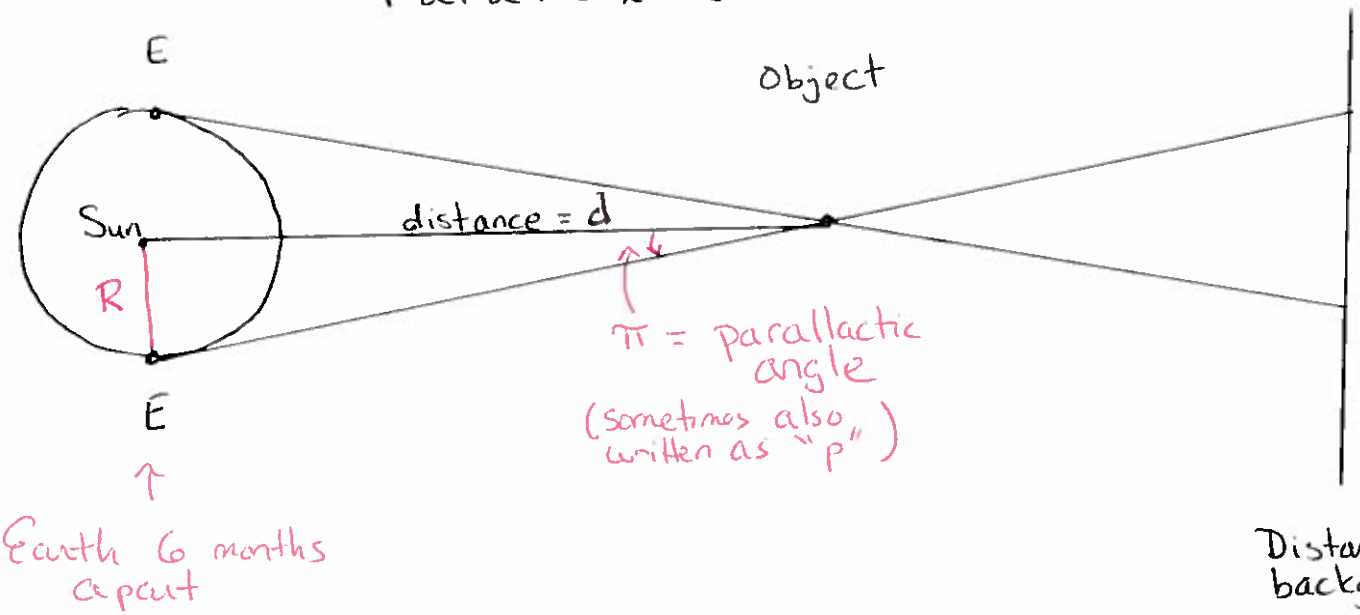
μas = micro-arcseconds = 10^{-6} of an arcsecond

↑

When prefixes are used, we don't use the $''$ notation but instead use "as" for arcseconds.

ASTR 250

Parallax and Distance



We defined the parsec (pc) as the distance to a source which subtends a parallactic angle of $1''$.

NOTE! NOT π the constant but an angle!

$$\tan \pi = \frac{R}{d}$$

If π is a small angle, we can expand tan in a Taylor expansion (Maclaurin)

small $\pi \Rightarrow \tan \pi \simeq \pi + \frac{1}{3}\pi^3 \approx \pi$ radians

$$\Rightarrow \pi = \frac{R}{d}$$

radians

same units (cm, ly, AU, pc, etc.)

Let's look at this formula when $R = 1$ AU, $d = 1$ pc, $\pi = 1''$

$$1'' = \frac{1 \text{ AU}}{1 \text{ pc}}$$ has to be true

$$\Rightarrow \quad \pi'' = \frac{1}{d \text{ pc}}$$ also true

example: if $\pi = 0.''5$ then $d = 2$ pc.
etc.