

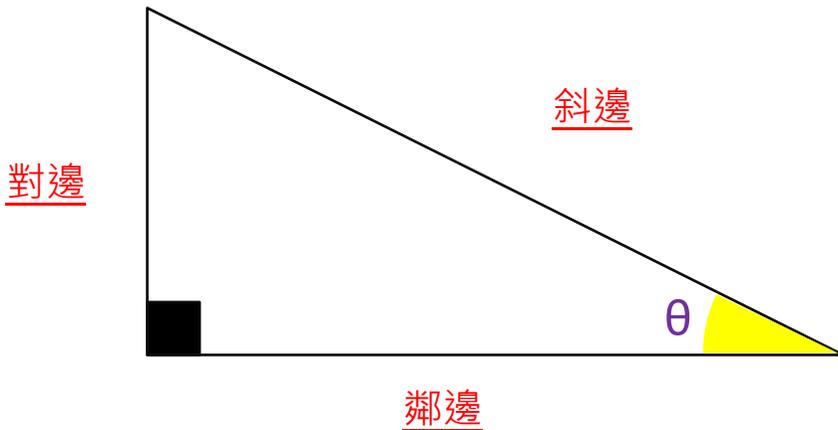
天文中的三角學 工作紙(答案)

姓名： _____

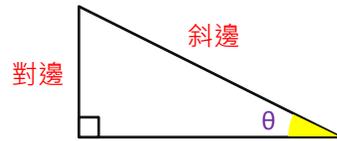
班別： _____

A. 數學概念重溫

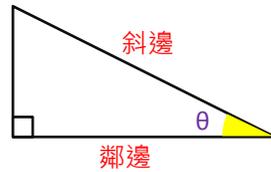
1. 間接的量度方法 - 三角學



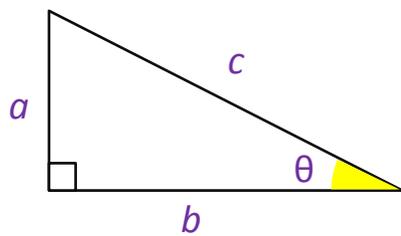
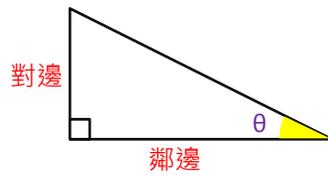
$$\text{Sin } \theta = \frac{\text{對邊}}{\text{斜邊}}$$



$$\text{Cos } \theta = \frac{\text{鄰邊}}{\text{斜邊}}$$



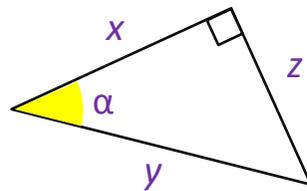
$$\text{Tan } \theta = \frac{\text{對邊}}{\text{鄰邊}}$$



$$\text{Sin } \theta = \frac{a}{c}$$

$$\text{Cos } \theta = \frac{b}{c}$$

$$\text{Tan } \theta = \frac{a}{b}$$

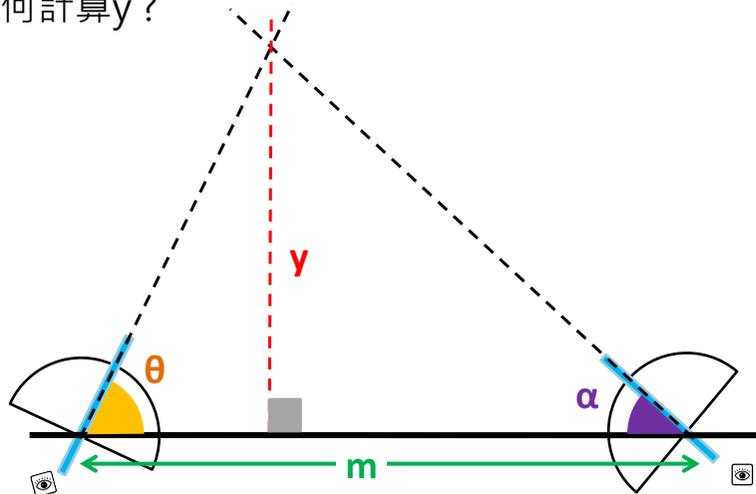


$$\frac{z}{y}$$

$$\frac{x}{y}$$

$$\frac{z}{x}$$

2. 如何計算y?



列出2個與y有關的方程式

方程式1

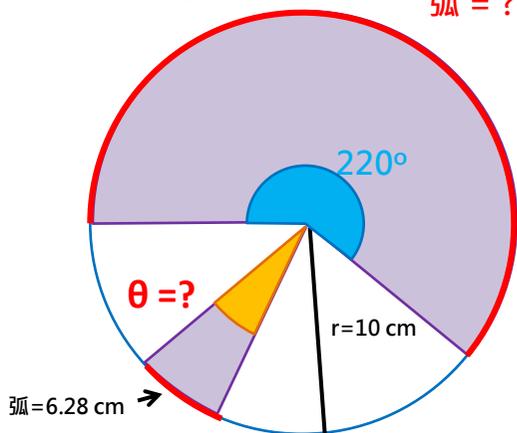
$$y = (m-x) \tan \theta$$

方程式2

$$y = x \tan \alpha$$

B.1. 如何利用圓周及角度的比例計算弧線的長度?

$$\frac{\text{圓周}}{360^\circ} = \frac{\text{弧}}{\text{角度}}$$



弧 = ?

$$\frac{\text{圓周}}{360^\circ} = \frac{\text{弧}}{\text{角度}}$$

$$\frac{2\pi(10)}{360^\circ} = \frac{\text{弧}}{220^\circ}$$

$$\text{弧} = 38.38$$

theta = ?

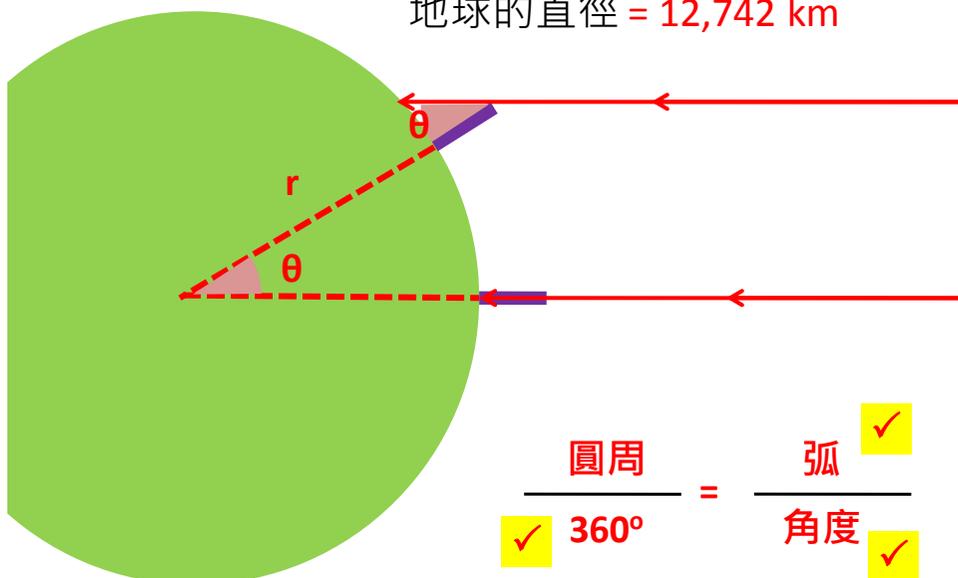
$$\frac{\text{圓周}}{360^\circ} = \frac{\text{弧}}{\text{角度}}$$

$$\frac{2\pi(10)}{360^\circ} = \frac{6.28}{\text{角度}}$$

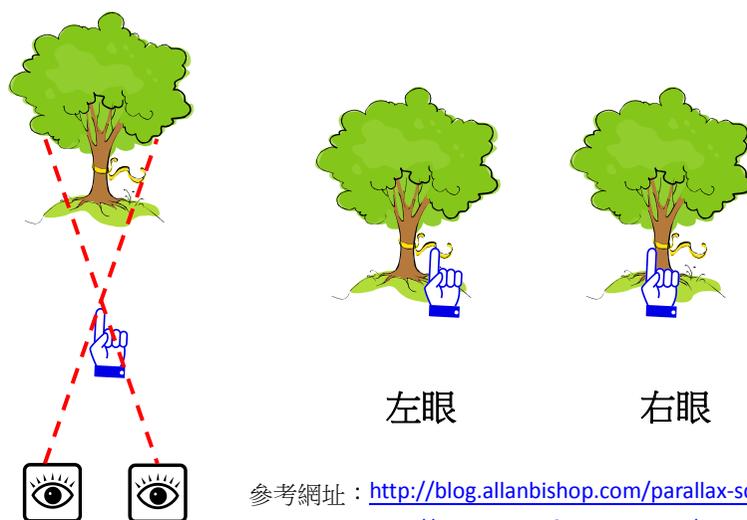
$$\text{角度} = 36^\circ$$

B.2. 如何計算地球大小？

地球的直徑 = 12,742 km



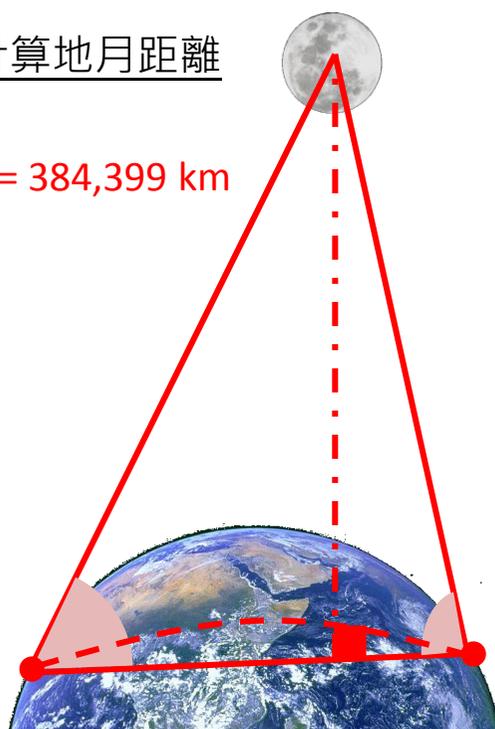
C. 視差法 (Parallax)



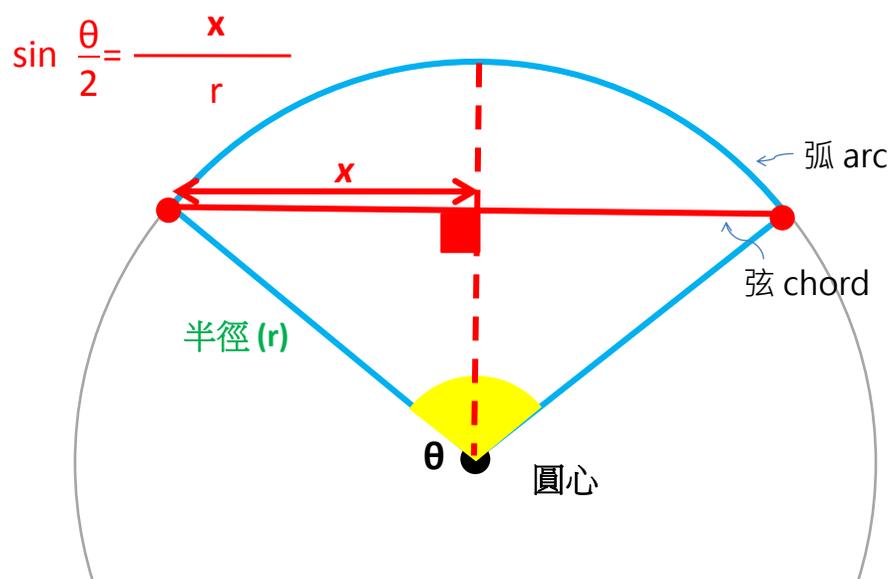
參考網址：<http://blog.allanbishop.com/parallax-scrolling/>
<http://www.scaleofuniverse.com/>

D.1. 如何計算地月距離

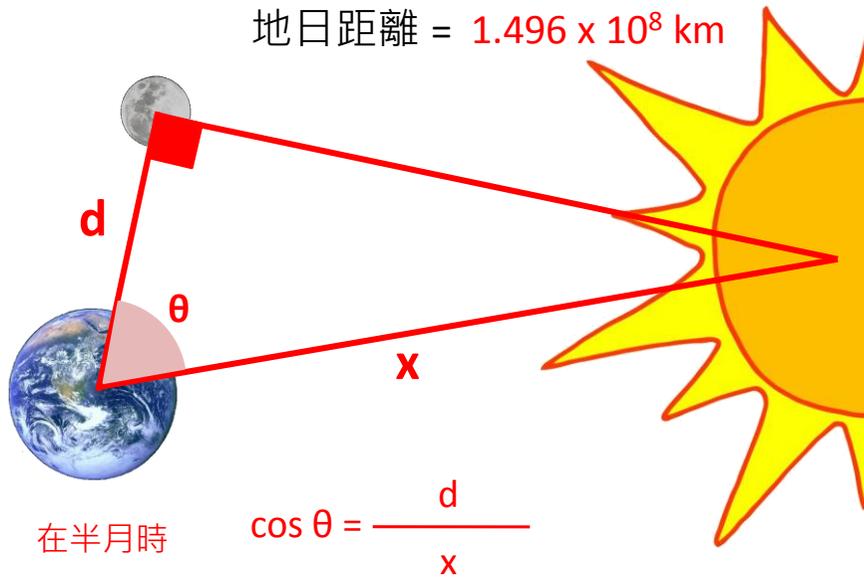
地月距離 = 384,399 km



D.2. 如何計算弦 (chord)

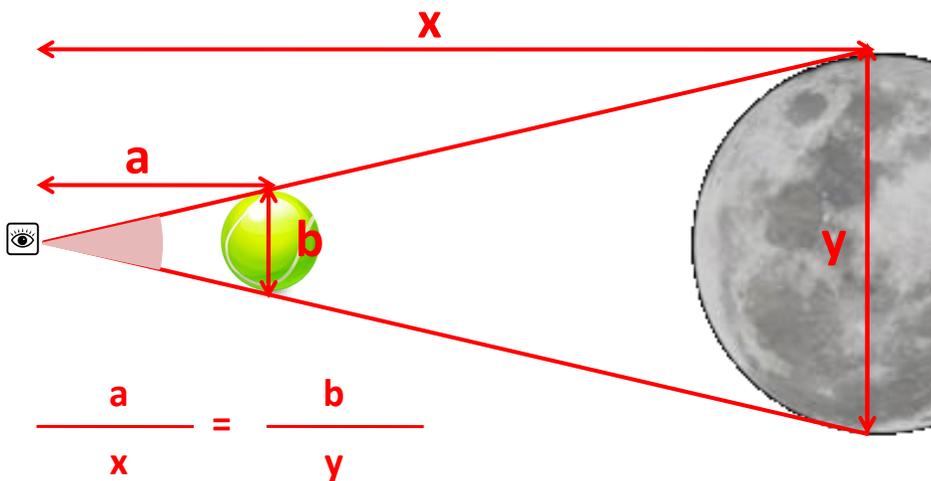


D.3. 如何計算地日距離



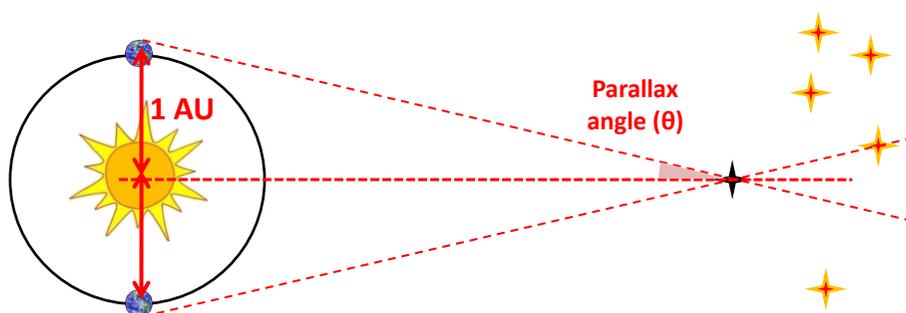
E. 如何計算月球的大小

月球直徑 = $1,737 \text{ km}$



F. 如何計算與其他恆星的距離

(視差法) Parallax



$$\tan \theta = \frac{1 \text{ AU}}{d}$$