Using your genius to measure the circumference of a plate, masquerading as the Earth, not forgetting the string.

DF
2016, December 2

N.B. Simultaneous observations.

for the empirical work

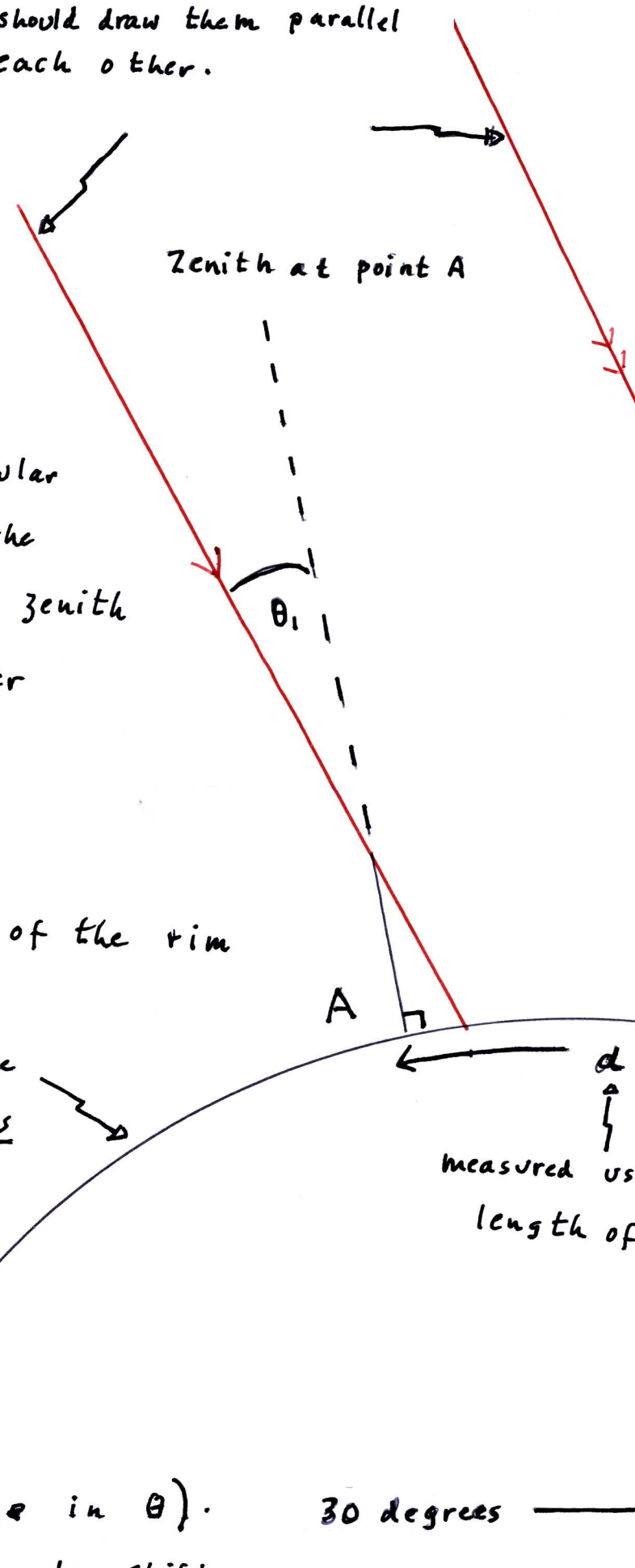
$\theta_1 = 18°$

$\theta_2 = 48°$

$\Delta\theta = 30$ degrees

Direction of the light from the distant Sun

You should draw them parallel to each other.



θ_1 is the angular distance of the Sun from the zenith for an observer at A.

θ_2 is the angular distance of the Sun from the zenith for an observer at B.

Zenith at Point B

Well, an arc of the rim

The rim of the plate represents the surface of the Earth

measured using a length of string...

$\Delta\theta$ (the change in θ).

This is the angular shift of the Sun, measured from the zenith, for locations A and B, which are at different positions on the surface of the Earth.

30 degrees $\longrightarrow$ 6·5 cm

$\therefore$ 1 degree $\longrightarrow \left(\frac{6 \cdot 5}{30}\right)$ cm

$\therefore$ 360 degrees $\longrightarrow \left(\frac{6 \cdot 5}{30} \times 360\right)$ cm

$\therefore$ the circumference of the plate = 78 cm

I then measured its radius to be 12·6cm $\therefore$ Circumference$_{\text{plate}}$ = 79 cm