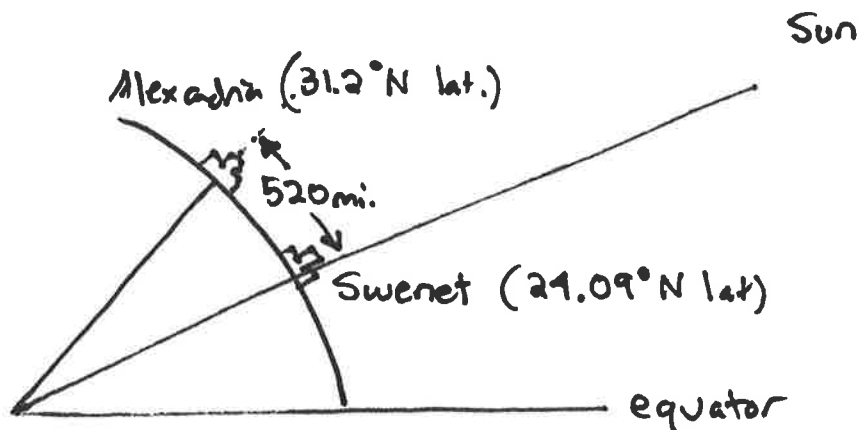


ASG v1 EX 9.1 (Measuring the earth)



A vertical stick in Alexandria casts a shadow as shown
← here.



a) Since the sun is directly overhead in Swenet, the shadow is of length $\boxed{0}$.

b) The angle of the shadow cast in Alexandria is

$$\theta = \arctan\left(\frac{16.5\text{in}}{120\text{in}}\right) = \boxed{7.8^\circ}$$

So Alexandria is 7.8° north of Swenet. This is close to the difference $31.2^\circ - 24.09^\circ = 7.1^\circ$

c) If 520 miles covers 7.8° , then how many miles cover 360° ? $\frac{x}{360} = \frac{520}{7.8} = \boxed{24,600 \text{ miles}}$

According to space.com (Dec 19, 2015) The pole-to-pole circumference of Earth is 24,860 miles.