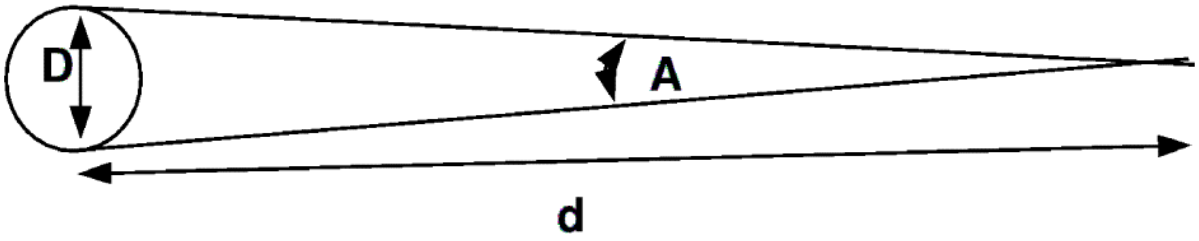
1. The small angle formula that relates angles to physical distances is this:



A=(D/d)x206,263 arc sec

If the Hubble Space Telescope can measure angles as small as 0.05 arcseconds, and the Moon is 384,000km away, then what would be the smallest object that you could detect on the Moon using the Hubble Space Telescope? (2)

2. Copernicus is a well known crater on the Moon's surface. It has a diameter of 93km. The human eye can resolve objects as small as one arcminute across. Should you be able to see Copernicus with the naked eye? (3)

3. The distance between the Earth and the Sun is 150,000,000km (an Astronomical Unit). How far away from the Solar System would you have to be for the Earth and Sun to appear one arcsecond apart? (2)

4. The positions of astronomical objects on the sky are measured in Right Ascension and Declination. Define what these terms mean. (4)

5. Why do we have to specify what year a given Right Ascension is valid in? (2)

6. What is the definition of a Solar day? What is the definition of a sidereal day? Why are these days not the same length? (3)

7. What do we mean when we talk about a *black body*? What does the spectrum of a black body look like? Do the spectra of stars resemble those of black bodies? Do the spectra of nebulae resemble those of black bodies? (4)

8. The Very Large Telescope in Chile has a mirror 8.2m in diameter. What is the smallest angular separation that the VLT could measure, theoretically, when observing light with a wavelength of 550nm? Why might it not reach this limit in practice? (4)

9. The VLT is a reflecting telescope. Give three reasons why it would be impractical to build a refracting telescope this large. (4)

10. The VLT is designed to observe visible light, with a typical wavelength of 550nm. If you wanted to observe radio waves with a wavelength of 55cm, at the same resolution as the VLT has in the optical, how large a radio telescope would you need? (2)