**Assignment 10 – Reflection Name: …………………………………..**

**Mirrors**

1. During the Apollo 11 Moon landing, a reflecting panel was set up on the Moon’s surface. A laser beam from Earth was reflected back from this panel, with the total time interval from leaving to returning measured at 2.51 seconds. What is distance between the surface of the Earth and the surface of the Moon? (2)
2. Two 1.0 m long mirrors are separated by a distance of 1.0 m. A beam of light is shone from the edge of one so that the angle of incidence upon the other one is 5 degrees. How many times will the beam of light be reflected by each of the mirrors? (hint – draw a diagram) (2)
3. You are taking a photo of yourself in the mirror. The camera uses an ultrasonic rangefinder to measure the distance between it and the object being photographed. Explain why is your image out of focus? (2)
4. A virtual image is often described as an image through which light rays don’t actually travel as they do for a real image. Can a virtual image be photographed? (2)
5. An object is placed 100 cm from a plane mirror. How far is the image from the object? (1)
6. Does your bathroom mirror show you older or younger than your actual age? Compute an order of magnitude estimate for the age difference based on your own data. Speed of light, $c=3×10^{8}m/s$ (2)
7. A concave spherical mirror has a radius of curvature of 20 cm. Locate the images for object distances of a) 40 cm, b) 20 cm and c) 10 cm. In each case, state whether the image is real or virtual, upright or inverted and find the magnification. You can use either calculations or ray diagrams. (3)