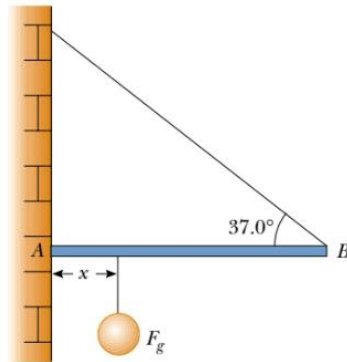


### Holiday package of Physics S4

1. A ray of light incident at an angle  $i$  on a prism of angle,  $A$ , passes through it symmetrically. Write an expression for the deviation,  $d$ , of the ray in terms of  $i$  and  $A$ . Hence find the value of  $d$ , if the angle of the prism is  $60^\circ$  and the refractive index of the glass is 1.48.
2. A sharp image is located 78.0mm behind a 65.0mm-focal-length converging lens. Find the object distance (a) using a ray diagram, (b) by calculation
3. a) State the laws of refraction of light.  
b) A microscope has an objective of focal length 10.0cm and eye piece of focal length 20.0cm. If the distance between the objective and eye piece is 20 cm, calculate the magnifying power of the microscope.
4. An astronomical telescope is used to view a scale that is 300 cm from the objective lens. The objective lens has a focal length of 20cm and the eye piece has a focal length of 2 cm. Calculate the angular magnification when the telescope is adjusted for minimum eye strain.
5. One end of a uniform 4.00-m-long rod of weight  $F_g$  is supported by a cable. The other end rests against the wall, where it is held by friction, as in Figure below. The coefficient of static friction between the wall and the rod is  $\mu_s=0.500$ . Determine the minimum distance  $x$  from point A at which an additional weight  $F_g$  (the same as the weight of the rod) can be hung without causing the rod to slip at point A.



Wish you Merry Christmas and Happy New Year!!!!!!!!!!