

## **7B Static Models & Tension**

1. A smooth bead, Y, is threaded on a light inextensible string. The ends of the string are attached to two fixed points X and Z on the same horizontal level. The bead is held in equilibrium by a horizontal force of 8N acting in the direction ZX. Bead Y hangs vertically below X and angle XZY =  $30^\circ$ .

Find:

- a) The tension in the string

- b) The weight of the bead

2. A Particle P with mass 8kg is suspended from two strings at point A and B. The angle PAB is  $30^\circ$  and the angle ABP is  $50^\circ$ .  
Find the Tension in the two strings

3. A mass of 3kg rests on the surface of a smooth plane inclined at an angle of  $45^\circ$  to the horizontal. The mass is attached to a cable which passes up the plane and passes over a smooth pulley at the top. The cable carries a mass of 1kg which hangs freely at the other end. There is a force of PN acting horizontally on the 3kg mass and the system is in equilibrium.

By modelling the cable as a light inextensible string and the masses as particles, calculate:

- a) The magnitude of P

- b) The normal reaction between the mass and the plane