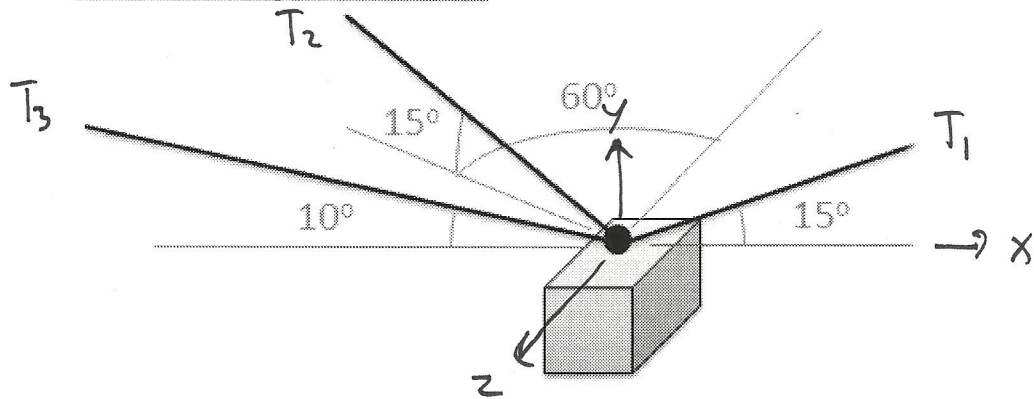
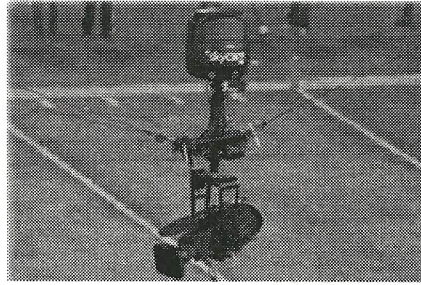
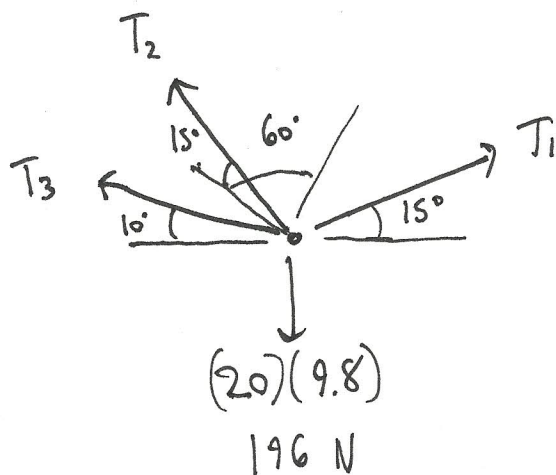


Question 4:

The skycam shown below is supported by three cables. Assuming the skycam has a mass of 20kg and that it is currently in equilibrium find the tension in each of the three cables supporting the skycam.



Calculations:



$$T_{2y} = T_2 \sin(15)$$

$$T_{2xz} = T_2 \cos(15)$$

$$T_{2x} = -T_2 \cos(15) \sin(60)$$

$$T_{2z} = -T_2 \cos(15) \cos(60)$$

$$\sum F_x = T_1 \cos(15) - T_2 \cos(15) \sin(60) - T_3 \cos(10) = 0$$

$$\sum F_y = T_1 \sin(15) + T_2 \sin(15) + T_3 \sin(10) - 196 = 0$$

$$\sum F_z = T_2 \cos(15) \cos(60) = 0$$

$$\rightarrow T_2 = 0$$

$$\rightarrow T_1 \cos(15) - T_3 \cos(10) = 0$$

$$T_1 = T_3 \frac{\cos(10)}{\cos(15)}$$

$$\rightarrow T_1 \sin(15) + T_3 \sin(10) = 196$$

$$\left(T_3 \frac{\cos(10)}{\cos(15)} \right) \sin(15) + T_3 \sin(10) = 196$$

$$0.4375 T_3 = 196$$

$$T_3 = 448.0 \text{ N}$$

$$T_1 = T_3 \frac{\cos(10)}{\cos(15)} = 456.7 \text{ N}$$

Solution:

$$T_1 = 456.7 \text{ N}$$

$$T_2 = 0$$

$$T_3 = 448.0 \text{ N}$$