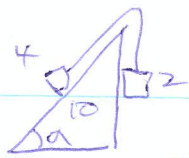


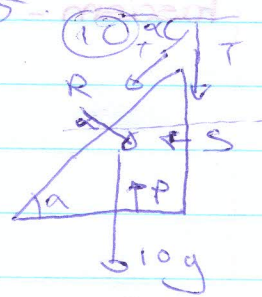
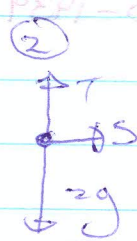
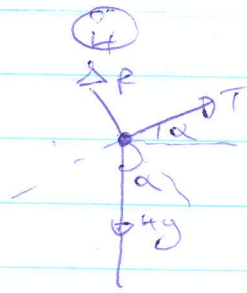
1993 H/a



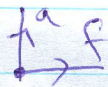
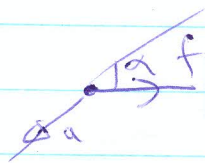
$$\tan \alpha = \frac{4}{3} \Rightarrow \cos \alpha = \frac{3}{5}$$

$$\sin \alpha = \frac{4}{5}$$

(i) forces:



accel:



N.I. 1 plane:

$$4g \cos \alpha - R = 4(f \sin \alpha) \quad (1)$$

\leftrightarrow

\leftrightarrow

$$S = 2f \quad (2)$$

$$-S + R \sin \alpha - T \cos \alpha = 10f \quad (3)$$

2 plane:

$$4g \sin \alpha - T = 4(a - f \cos \alpha) \quad (4)$$

$$T - 2g = 2a \quad (5)$$

$$R - 10g - T - T \sin \alpha = 0 \quad (6)$$

Find f: Elim a from (2) and (4)

$$4g \sin \alpha - T = 4 \left(\frac{T - 2g}{2} - f \cos \alpha \right)$$

$$\Rightarrow 4g \frac{3}{5} - T = 4 \left(\frac{T - 2g}{2} - f \frac{4}{5} \right)$$

$$\Rightarrow \frac{12}{5}g - T = 2T - 4g - \frac{16}{5}f$$

$$\Rightarrow 12g - 5T = 10T - 20g - 16f$$

$$\Rightarrow 32g + 16f = 15T$$

$$\Rightarrow T = \frac{32g + 16f}{15}$$

Into (3) from (2), (1), (5) \Rightarrow

$$-2f + \left[-4f \sin \alpha + 4g \cos \alpha \right] \sin \alpha - \left[\frac{32g + 16f}{15} \right] \cos \alpha = 10f$$

$$\Rightarrow -2f + \left[\frac{16g}{5} - \frac{12f}{5} \right] \frac{3}{5} - \left[\frac{32g + 16f}{15} \right] \frac{4}{5} = 10f$$

$$\Rightarrow -50f + 48g - 36f - \frac{1}{3} [128g + 64f] = 250f$$

$$\Rightarrow -150f + 144g - 108f - 128g - 64f = 750f$$

$$\Rightarrow 16g - 128g = 750f + 250f + 108f + 64f$$

$$16g = 1072f$$

$$\frac{16g}{1072} = f \Rightarrow f = \frac{g}{67} \text{ gsd.}$$