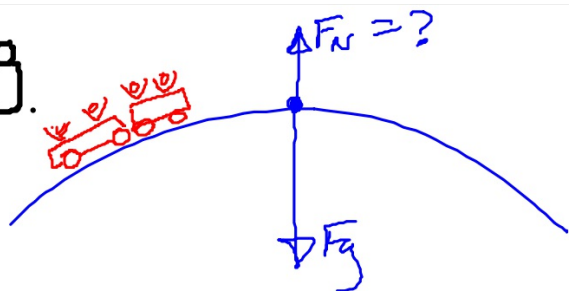


48.



$$\Sigma F_c = ma_c$$

$$F_g - F_N = \frac{mv^2}{r}$$

$$11760 - F_N = \frac{(1200)(11)^2}{18}$$

$$F_N = 3693 \text{ N}$$

(up)

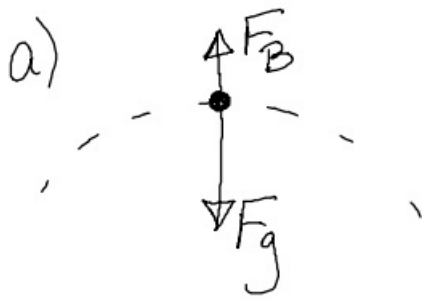
c)

$$11760 - F_N = \frac{(1200)(14)^2}{18}$$

$$F_N = -1307 \text{ N}$$

opposite what I drew, so DOWN

$$52. F_B = ?$$



$$\Sigma F_c = ma_c$$

$$F_g - F_B = \frac{mS^2}{r}$$

$$mg - \frac{mS^2}{r} = F_B$$

$$F_g = mg$$

$$5000 = m(9.8)$$

$$m = 510.2 \text{ kg}$$

$$m\left(g - \frac{S^2}{r}\right) = F_B$$

$$510.2\left(9.8 - \frac{5^2}{10}\right) = F_B$$

$$3724 \text{ N} = F_B$$

(up)

$$c + d \quad S = 12 \text{ m/s}$$

$$m\left(g - \frac{S^2}{r}\right) = F_B$$

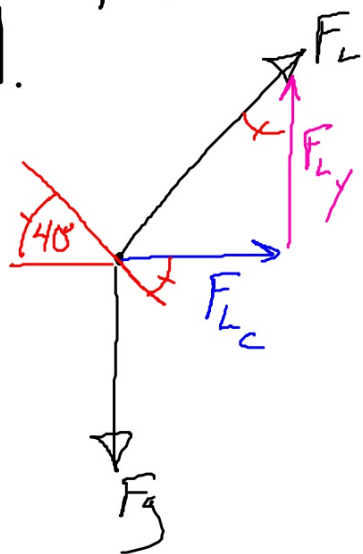
$$510.2\left(9.8 - \frac{12^2}{10}\right) = F_B$$

$$-2347 \text{ N} = F_B$$

$$F_B = 2347 \text{ N DOWN}$$

51.

$r = ?$



$$F_y = F_g \quad (a_y = 0)$$

$$\Sigma F_c = ma_c$$

$$F_{Lc} = \frac{mv^2}{r}$$

$$F_{Ly} = mg$$

$$F_L \cos \theta = mg$$

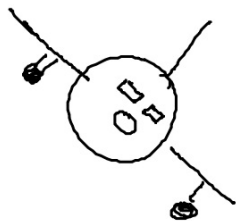
$$F_L = \frac{mg}{\cos \theta}$$

$$F_L \sin 40^\circ = \frac{mv^2}{r}$$

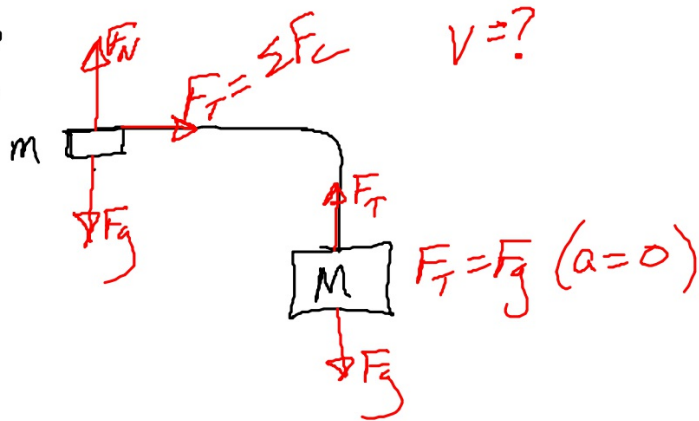
$$\frac{mg}{\cos \theta} \sin \theta = \frac{mv^2}{r}$$

$$g \tan \theta = \frac{v^2}{r}$$

$$r = \frac{v^2}{g \tan \theta}$$



57.



$$\Sigma F_c = ma_c$$

$$F_T = \frac{mv^2}{r}$$

$$Mg = \frac{mv^2}{r}$$

$$\frac{Mgr}{m} = v^2$$

$$\sqrt{\frac{(2.5)(9.8)(0.2)}{1.5}} = v$$

$$1.81 \text{ m/s} = v$$