

P12 - 7.7 - Hills Notes

A 2kg cart goes over a circular hill of $r = 15$ at $5 \frac{m}{s}$. Find F_n at top.

$$F_c = ma_c$$

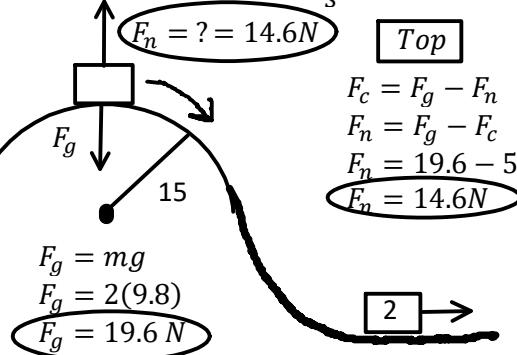
$$F_c = \frac{mv^2}{r}$$

$$F_c = \frac{2(5)^2}{10}$$

$$F_c = 5N$$

$$v = 5$$

Side View



Find the minimum v
not to take air.

$$F_c = F_g - F_n$$

$$F_n = F_g - F_c$$

$$F_n = 19.6 - 5$$

$$F_n = 14.6N$$

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

$$v = \sqrt{gr}$$

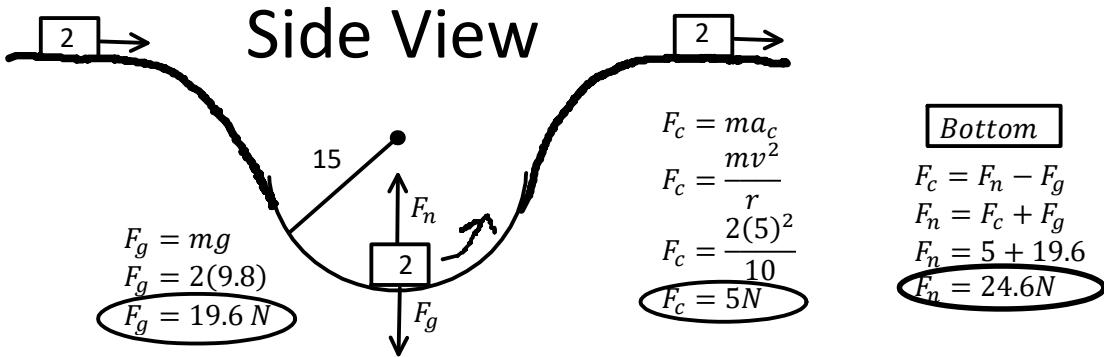
$$v = \sqrt{9.8(15)}$$

$$v = 12.1 \frac{m}{s}$$

A 2kg cart goes down a circular hill of $r = 15$ at $5 \frac{m}{s}$. Find F_n at bottom.

$$v = 20$$

Side View



Bottom

$$F_c = ma_c$$

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

$$F_c = \frac{2(5)^2}{10}$$

$$F_c = 5N$$

$$F_c = F_n - F_g$$

$$F_n = F_c + F_g$$

$$F_n = 5 + 19.6$$

$$F_n = 24.6N$$