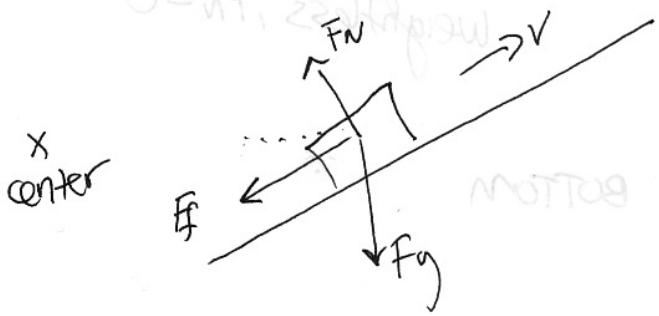
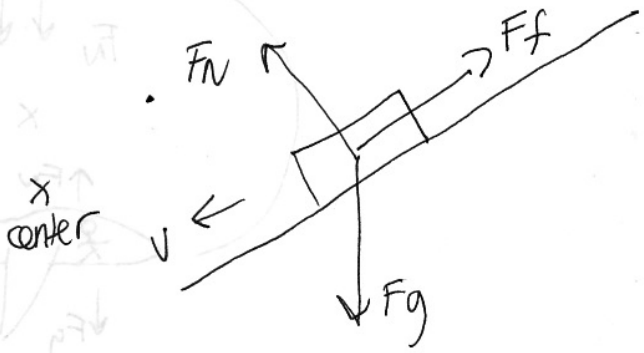
1. Racing Car





V > recommended

V < recommended

NOTE: velocity is not a force/accelerator.

$x: F_N \sin\theta + F_f \cos\theta = \frac{mv^2}{r}$

$y: F_N \cos\theta - F_f \sin\theta = F_g$

$x: F_N \sin\theta - F_f \cos\theta = \frac{mv^2}{r}$

$y: F_N \cos\theta + F_f \sin\theta = F_g$

$\rightarrow F_f = 0 \leftarrow$

$\therefore v^2 = rg \tan\theta$

$v = 3.80 \times 10^1 \text{ m/s}$

$V = 30 \text{ m/s}$ < recommended speed

$\therefore$ Friction acts up the ramp.

~~Normal = 10,984~~

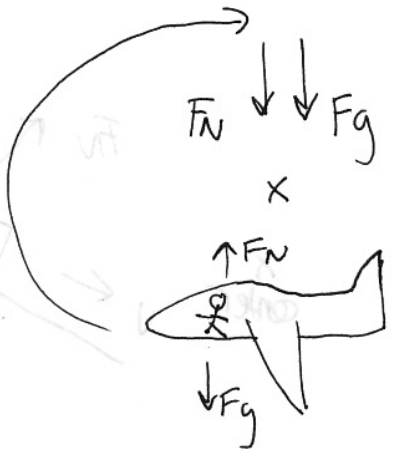
~~Friction~~

$F_N \sin\theta - \mu F_N \cos\theta = 3000$

$F_N \cos\theta + \mu F_N \sin\theta = 9810$

* you can finish solving for math.

2.



weightless, $F_N = 0$

TOP $\therefore F_N + F_g = \frac{mv^2}{r}$

$mg = \frac{mv^2}{r}$ $\therefore v = \sqrt{rg}$

$v = 50.0 \text{ m/s}$.

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

F_N ↑ anti centre

$(250)\frac{(2000 - (50)(9.81))}{(50)} = v^2$ $\therefore v = 8.7 \times 10^1 \text{ m/s}$

IF SHE IS TRAVELING 87m/s AT TOP OF LOOP THEN, YES, BRAKE.