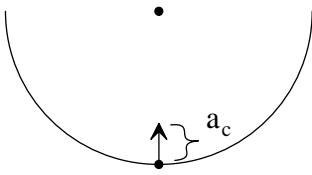


Find the acceleration:



1) The acceleration of the pilot is centripetal. The formula

that gives this is $a_c = \frac{v^2}{r}$

2) To convert $k \frac{\text{km}}{\text{hr}}$ to $\frac{\text{meters}}{\text{second}}$, replace k with your specific number, and perform the calculation below.

$$k \frac{\text{km}}{\text{hr}} \times \frac{1 \text{ hr}}{3600 \text{ s}} \times \frac{1000 \text{ m}}{1 \text{ km}} = \frac{k (1000 \text{ m})}{3600 \text{ s}} = \frac{1000k \text{ m}}{3600 \text{ s}}$$

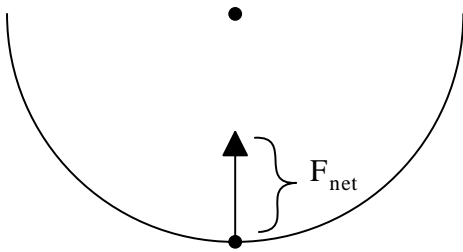
Be sure to simplify the last step once you put in your specific k .

For example, when $k=100$, we get

$$\frac{1000(100) \text{ m}}{3600 \text{ s}} = \frac{1000 \times 100 \text{ m}}{36 \times 100 \text{ s}} = \frac{1000 \text{ m}}{36 \text{ s}} = 27.778 \frac{\text{m}}{\text{s}}$$

3) Now apply $a_c = \frac{v^2}{r}$ to get the centripetal acceleration.

Find the net force.



The net force is found from the usual $F=ma$.

This means replace m with the specific m you're given, and replace a with the acceleration found above.

So you should have $F_{\text{net}} = ma_c$

Find the force with which the seat pushes on the pilot.

Here, $F_{\text{seat}} - mg = F_{\text{net}}$

However, $F_{\text{net}} = ma$, so replace

$$F_{\text{seat}} - mg = ma$$

At this point, move mg to the right side to isolate F_{net} and factor m out

Plug in the values given and you're done. Remember that this is the same a as above. It's a_c , in other words.

$$F_{\text{seat}} = ma_c + mg = m(a_c + g)$$

