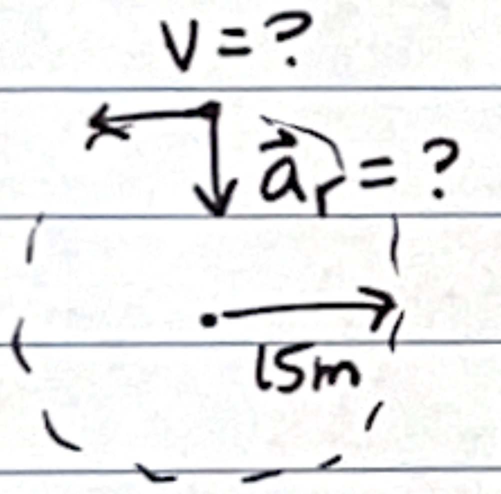
p.199 #23 Note: When the book uses the term "weight", it means the force of the surface on you, which is the normal force. (A rather unfortunate way to define the term.) "Weight" is better defined as the force of gravity.

So... in this problem you are to find the ratio of the normal force on you at the top or bottom of the ride to the normal force on you when you are standing on the ground.

a)



$T = 25s$

$v = \frac{2\pi r}{T}$

$v = \frac{2\pi(15m)}{25s}$

$v = \boxed{3.77\ m/s}$

$a_r = \frac{v^2}{r}$

$a_r = \frac{(3.77\ m/s)^2}{15m}$

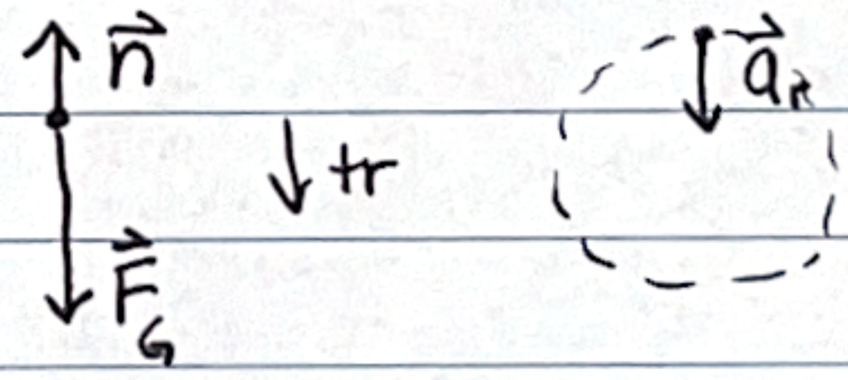
$a_r = \boxed{0.95\ m/s^2}$

So my speed is 3.77 m/s and the magnitude of my acceleration is 0.95 m/s²

b) Need ratio of $\frac{n_{top}}{n_{ground}}$

$n_{ground} = mg = m(9.8\ m/s^2)$

At top:



$\Sigma F_r = ma_r$

$F_G - n_{top} = ma_r$

$n_{top} = F_G - ma_r$

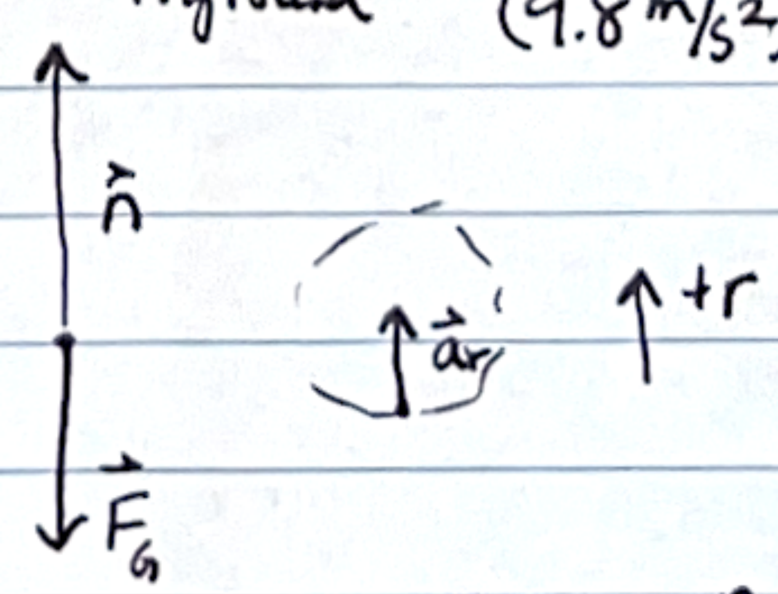
$n_{top} = mg - ma_r$

$n_{top} = m(9.8\ m/s^2 - 0.95\ m/s^2)$

$n_{top} = (8.85\ m/s^2)m$

Ratio $= \frac{n_{top}}{n_{ground}} = \frac{(8.85\ m/s^2)m}{(9.8\ m/s^2)m} = \boxed{0.9}$

At bottom:



$\Sigma F_r = ma_r$

$n_{Bot.} - mg = ma_r$

$n_{Bot.} = m(g + a_r)$

$= m(9.8\ m/s^2 + 0.95\ m/s^2)$

$= m(10.75\ m/s^2)$

Ratio $= \frac{n_{Bot.}}{n_{ground}}$

$= \frac{m(10.75\ m/s^2)}{m(9.8\ m/s^2)}$

$= \boxed{1.1}$