

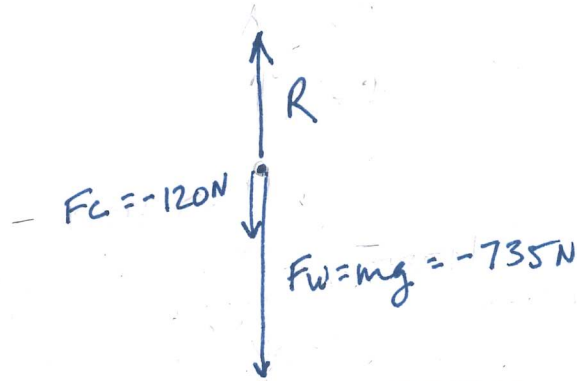
Quiz 4B | Vertical Circular Motion

Name: *Key*

Period: _____

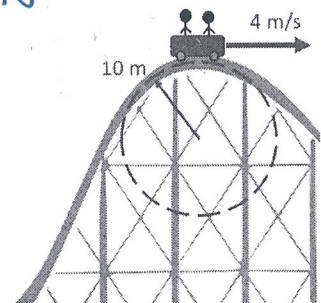
What is the apparent weight (same as normal reaction force R) of a 75 kg rider while going over the hill of a roller coaster with a 10-meter radius and a velocity of 4 m s^{-1} ? Draw a free body diagram and solve for R .

m	75 kg
v	$4 \text{ m} \cdot \text{s}^{-1}$
r	10 m
$F_c \frac{mv^2}{r}$	-120 N
F_{net}	-120 N
F_g	-735 N
R	+615 N



$$F_c = F_{\text{net}} = -120 \text{ N} = R + (-735 \text{ N})$$

$$R = -120 \text{ N} + 735 \text{ N} = +615 \text{ N}$$



Do the riders feel effectively lighter or heavier at the top of the hill?

Quiz 4A | Constant Circular Motion

Name: Key Period: _____

You squash a 0.005 kg beetle with your bike tire of radius 0.4 m and roll along at period of 1.2 seconds per wheel rotation. Fill in the table with the missing information about the beetle's ride on the outside of your tire.

T	1.2 s
$\omega = \frac{2\pi}{T}$	$= 5.2 \frac{\text{rad}}{\text{s}}$
r	0.4 m
$v = \frac{2\pi r}{T}$	$2.1 \frac{\text{m}}{\text{s}}$
$\alpha_c = \frac{v^2}{r}$	11 m/s^2
F_c	$.05 \text{ N}$

Quiz 4A | Constant Circular Motion

Name: Key Period: _____

You squash a 0.005 kg beetle with your bike tire of radius 0.4 m and roll along at period of 1.2 seconds per wheel rotation. Fill in the table with the missing information about the beetle's ride on the outside of your tire.

T	1.2 s
$\omega = \frac{2\pi}{T}$	$= 5.2 \frac{\text{rad}}{\text{s}}$
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$\alpha_c = \frac{v^2}{r}$	11 m/s^2
F_c	$.05 \text{ N}$