

Diagram showing a car on a circular path. A downward arrow is labeled F_{road} and another downward arrow is labeled a_c . The center of the circle is marked with a dot.

Equations:

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

$$\Sigma F = F_{road}$$

$$\frac{mv^2}{r} = F_{road}$$

$$\frac{500\text{kg}(20\text{m/s})^2}{20\text{m}} = F_{road}$$

$$F_c = 10,000\text{N} = F_{road}$$

a. what is the normal force when she is at the top of the circle?
 b. What is the normal force when she is at the bottom of the circle?

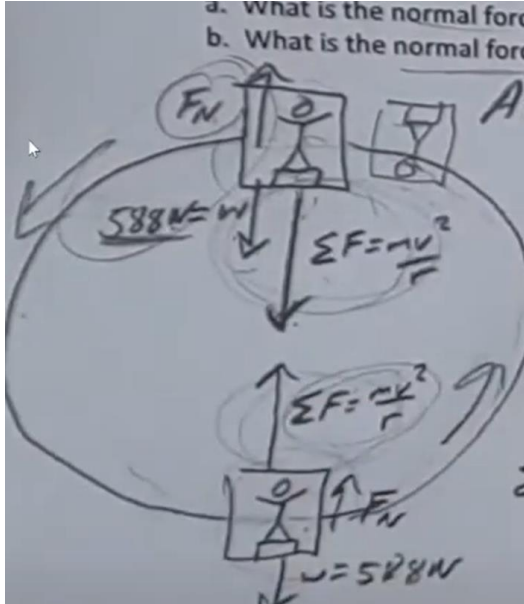


Diagram showing a person on a circular path. At the top, a downward arrow is labeled $\Sigma F = \frac{mv^2}{r}$ and a weight vector is labeled $588\text{N} = w$. At the bottom, an upward arrow is labeled $\Sigma F = \frac{mv^2}{r}$ and a weight vector is labeled $w = 588\text{N}$.

Calculations for the top of the circle:

$$A + top \quad \Sigma F = -\frac{mv^2}{r}$$

$$\Sigma F = F_N - 588\text{N}$$

$$\frac{-60\text{kg}(5\text{m/s})^2}{4\text{m}} = F_N - 588\text{N}$$

$$-375\text{N} = F_N - 588\text{N}$$

$$\boxed{213\text{N} = F_N}$$

Calculations for the bottom of the circle:

$$A + Bottom$$

$$\Sigma F = \frac{mv^2}{r} = 375\text{N}$$

$$\Sigma F = F_N - 588\text{N}$$

$$F_N - 588 = 375\text{N}$$

$$\boxed{F_N = 963\text{N}}$$