

61. In both cases (highest point and lowest point), the normal force (on the child from the seat) points up, gravity points down, and the y axis is chosen positive upwards. At the high point, the direction to the center of the circle (the direction of centripetal acceleration) is down, and at the low point that direction is up.

(a) Newton's second law (using Eq. 6-17 for the magnitude of the acceleration) leads to

$$N - mg = m \left(-\frac{v^2}{R} \right) .$$

With $m = 26$ kg, $v = 5.5$ m/s and $R = 12$ m, this yields $N = 189$ N which we round off to $N \approx 190$ N.

(b) Now, Newton's second law leads to

$$N - mg = m \left(\frac{v^2}{r} \right)$$

which yields $N = 320$ N. As already mentioned, the direction of \vec{N} is *up* in both cases.