

- d. At the top of the loop with the Ferris wheel going slowly, the force meter will show a force of (more / less) than 750 N.
- e. Draw a free body diagram of the clown at the top of the loop. The Ferris wheel is going very fast, so the clown experiences negative g's and is thrown up into the safety lap bar.

- f. At the top of the loop with the Ferris wheel going very fast, the force meter will show a force of (more / less) than 750 N.

Questions

1. A circular Ferris wheel with a diameter of 50 m makes 3.00 full revolutions per minute (rpm). A tourist with a weight of 850 N rides the Ferris wheel.
 - a. What normal force does the chair exert on the tourist at the bottom of the Ferris wheel?
 - b. What normal force does the chair exert on the tourist at the top of the Ferris wheel?
 - c. How many revolutions per minute would result in the tourist experiencing weightlessness at the top?
 - d. How many revolutions per minute would result in the tourist experiencing $-1g$ at the top?
2. The CF-18 Hornet has a top speed of 1,814 km/h and a mass of 16,851 kg. The plane is flying at its top speed directly down towards the Earth.
 - a. What is the smallest radius circle the pilot can take, turning the plane in the direction of their head such that they will be head-up at the bottom of the circle?
 - b. What is the smallest radius circle the pilot can take, turning the plane in the direction of their feet such that they will be head-down at the bottom of the circle?

Answers

1.
 - a. $F_N = 1,100 \text{ N [up]} = 1.1 \text{ kN [up]}$
 - b. $F_N = 640 \text{ N [up]}$
 - c. 6.0 rpm
 - d. 8.5 rpm
2.
 - a. $r = 3,200 \text{ m} = 3.2 \text{ km}$
 - b. $r = 13,000 \text{ m} = 13 \text{ km}$