

Worksheet 7.2 Centripetal Force

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

1. A 2500 kg car enters a curve with a radius of 45 m. If the car is moving at a speed of 35 m/s, what is the centripetal force that maintains the car's circular motion through the curve?
2. A student is riding on a carousel at a speed of 4.0 m/s. If the Carousel has a radius of 5.0 m and the centripetal force is 240 N, what is the student's mass?
3. A 25 kg girl sitting on a carousel is moving at a speed of 4.0 m/s. If the girl is 5.0 m from the axis of the carousel, what is the centripetal force that maintains her circular motion?
4. A NASCAR driver weighing 75 kg enters a corner with a radius of 155 m with a speed of 125 m/s. What is the centripetal force that maintains his circular motion?
5. A girl sits on a tire swing that is attached with a rope that is 2.10 m in length. Her dad pushes her with a speed of 2.5 m/s. If the centripetal force is 88.0 N, what is the girl's mass?
6. A bicycle racer is riding at a speed of 13.2 m/s around a circular track with a radius of 40.0 m. If the magnitude of the centripetal force is 377 N, what is the combined mass of the bike and rider?
7. A 905 kg test car travels around a 3.25 km circular track. If the magnitude of the centripetal force is 2140 N, what is the car's speed?
8. A pilot is flying a small plane at 30.0 m/s in a circular path with a radius of 100.0 m. If a centripetal force of 635 N is needed to maintain the pilot's circular motion, what is the pilot's mass?