

# #1 Circular Motion

Equations:  $T = 1/f$   $v = 2\pi r/T$   $a_c = v^2/r$   $F_c = mv^2/r$

- 1) What is the period of rotation if the frequency is 28.2 Hz?
- 2) What is the frequency if the period of rotation is 0.88s?
- 3) What is the linear speed of a child that sits on the merry-go-round at a distance that is 0.86m from the center and it has a period of rotation of 5.02s?
- 4) What distance is a person on the graviton from the center if it spins with a frequency of 0.23 Hz, and his linear velocity is 4.38m/s?
- 5) What is the angular speed for an object that has a frequency of 0.25 Hz?
- 6) If the linear speed of an object is 3.8m/s and the object is 0.81m from the center, then what is the centripetal acceleration?
- 7) What is the centripetal acceleration of a object that is spinning with a period of revolution of 3.22s, and is a distance of 0.38m?
- 8) What is the centripetal force for an object that has a mass of .048kg and has a linear velocity of 2.32m/s and is at a distance of 0.73m from the axis of rotation?
- 9) If a centripetal force of 12.3N is applied to a 2.1kg object that is rotating at a distance of 3.8m from the axis of rotation, then what is its velocity?
- 10) What radius is an object rotating at if the velocity of the object is 6.2m/s, the mass of the object is 5.3kg, and it requires a force of 23.6N to keep it moving?

## Answers

- 1) 0.035 s
- 2) 1.14 Hz
- 3) 1.08m/s
- 4) 3.03m
- 5)  $90^0/s$
- 6)  $17.82m/s^2$
- 7)  $1.45m/s^2$
- 8) 0.35N
- 9) 4.72m/s
- 10) 8.63m