**Centripetal Force Worksheet**

1. What is the centripetal acceleration of an object moving in a circular path of 20 m radius

at a speed of 20 m/sec? 20 m/sec2

1. A 2 kg mass is attached to a string 1 m long and swings in a circle parallel to the horizontal. If the

mass goes around its path each 0.8 sec, a. 61.6 m/s

(a) What is its centripetal acceleration? b. 123.2 N

(b) What is the tension is in the string?

1. It takes a 600 Kg racing car 10 sec to travel at a uniform speed around a circular racetrack

with a radius of 50 m? a. 1.2 x 104 N

(a) What average force must the car's tires exert against the track to maintain this circular motion? b. 19.8 m/sec2

1. What is the acceleration of the car?
2. A child twirls a yo-yo about his head. The yo-yo has a mass of 0.2 kg and is attached to a string

0.8 m long. a. 6.3 N

1. If the yo-yo makes one complete revolution each second, What tension must exist b. 25.2 N

 in the string? c. 4:1

1. If the child increases the speed to two revolutions per second, what tension must

 be in the string?

(c) What is the ratio of the solution of (b) to (a)?

5. The radius of the moon's path about the earth is about 3.6 x 108 m. The moon's period is

 2.3 x 106 seconds (27.3 days). Find the centripetal acceleration of the moon. 2.68x10-3 m/s2

1. Calculate the velocity at which a satellite must be launched in order to achieve an orbit about the earth.

 Use 9.8 m/s2 as the acceleration of gravity and 6500 km as the earth's radius. 8 km/s

7. During the lunar landings, the command module orbited the moon while waiting for the lunar module to

 return from the surface of the moon. If the diameter of the moon is 3750 km and the acceleration 1.7 km/sec

 of gravity on the moon is 1.6 m/sec2. At what velocity did the command module orbit the moon?