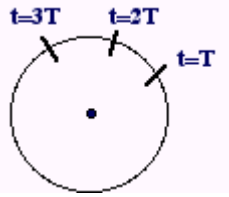
Name: _____ Practice Ph12 3-2

1. What is the minimum frequency that a pail of water on a 1.6 m cord can be revolved in a vertical plane so that the water does not spill?

2. A proton situated in a magnetic field is observed to travel in a circular path. The positions of the proton at times T, 2T, and 3T are shown in the figure below.



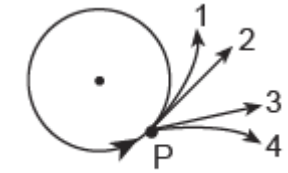
Which vector best represents the **instantaneous velocity** of the proton at t=2T?

A.  B.  C.  D.  E. 

3. A ferris wheel at a carnival has a diameter of 10 m. It rotates at a rate of one revolution every minute. The magnitude of the centripetal acceleration on a student sitting in one of the ferris wheel chairs is:
   A. 7.0 m/s^2
   B. 0.1 m/s^2
   C. 0.05 m/s^2
   D. 385 m/s^2
   E. 0 m/s^2

4. Calculate the acceleration of Earth around the Sun.
   A. 3.5×10^{22} m/s^2
   B. 0 m/s^2
   C. 9.8 m/s^2
   D. 5.9×10^{-3} m/s^2

5. When an object moving in a horizontal circle breaks free at point P, it will follow which path?



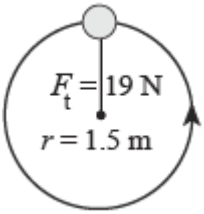
Viewed from above

   A. 4
   B. 3
   C. 2
   D. 1

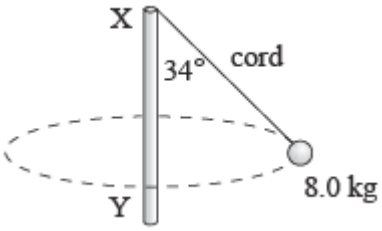
6. Which of the following best describes uniform circular motion?

	SPEED	VELOCITY	ACCELERATION
A.	changing	changing	changing
B.	constant	constant	constant
C.	constant	constant	changing
D.	constant	changing	changing

7. What angle (in degrees) would a road have to be banked so that a 1.2×10^3 kg car could go around a 72 m corner at 22 m/s with-out any frictional forces acting on the tires?

8. 

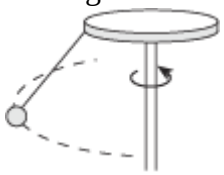
The above diagram shows a steel sphere of mass 5.0 kg travelling in a vertical circular path of radius 1.5 m. Since the sphere is at the end of a string and is travelling in a vertical circular path its speed is not constant. If the tension in the string at the top of the loop is 19 N, what is the tension (in Newtons) at the bottom of the loop?

9. 

The above diagram shows an 8.0 kg object, attached to a cord, moving in a horizontal circular path around the vertical pole XY. The angle between the pole and the cord is 34.0°. What is the centripetal force acting on the 8.0 kg mass?

A. 140 N
B. 6.6 N
C. 18 N
D. 53 N

10. An object attached to a rotating table is moving in a circular path with a constant speed.

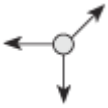


Which is the correct free body diagram for the object?

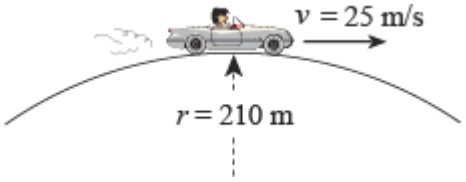
A. 

B. 

C. 

D. 

11. A 1400 kg car is travelling at 25 m/s on a circular hill of radius 210 m. What is the normal force on this car at the top of the hill?



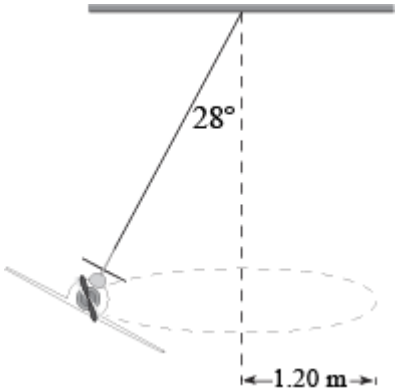
A. 2.3×10^4 N
B. 4.2×10^2 N
C. 9.6×10^3 N
D. 1.4×10^4 N

12. A 1200 kg car is travelling around a horizontal path of diameter 124 m. The coefficient of friction between the tires and the road is 0.67. What is the maximum speed of the car on this path?

A. 20 m/s
B. 7.9 m/s
C. 29 m/s
D. 24 m/s

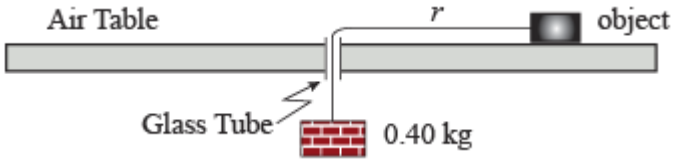
Use the following information to answer the next 2 questions.

The diagram shows a toy plane flying in a circle of radius 1.20 m, supported by a string which makes an angle of 28° with the vertical. The tension in the string is 1.80 N.



13. What is the mass of the plane?

14. How long does the plane take to complete one orbit?

15. 

As shown in the above diagram, an object of mass (*m*) is in uniform circular motion about a glass tube inserted into a horizontal air table. The centripetal force is provided by a hanging mass of 0.40 kg. The radius (*r*) of the circular path is 0.35 m, and the period of revolution is 0.80 s. Frictional forces are negligible. What is the mass of the object?