Worksheet - Circular Motion - Period & Speed   Name:

1. Find the period of rotation for the following situations:
   A car travels around a track twice in 68 seconds.   A CD spins 3.5 times per second.

   A vinyl record spinning at 45 RPM.   The hour hand on a clock.

2. Calculate the period:
   18 rotations in 36 seconds.   45 seconds for 3 revolutions

   3600 vibrations in 60 seconds   600 oscillations in 1 *minute*

3. Correct the following statement by changing <u>one word</u>:
   The car rounds the turn at a constant velocity of 45 km/hr.

3. An object moves in a circular path with constant speed.
   a. Is the object's velocity constant? Explain

   b. Is the object accelerating? Explain.

4. $$v = \frac{2\pi r}{T}$$

   v = _____   v = 300 m/s   v = 10 m/s
   r = 3 m   r = _____   r = 1.5 m
   T = 2 s   T = 10 s   T = _____

5. 2 r -> ____ v   ½ T -> ____ v   2 r & 2 T -> ____ v

    ⅕ r -> ____ v   10 T -> ____ v   3 r & ⅙ T -> ____ v

6. A ball travels around a circular track with a radius of 1.5 m. The ball travels once around the circle every 4 sec. What is the linear (aka tangential) speed of the ball?

7.   A car travels around a circular track. The radius of the track is 900 m. The car travels once around the circle every 4 minutes. What is the linear or tangential speed of the car?

8. $\omega = \dfrac{v}{r} = \dfrac{2\pi}{T}$

ω = _____   ω = 60 rad/s   ω = _____
v = 60 m/s   v = _____   T = 4π
r = 2 m   r = 2 m

9.   4 v -> _____ ω   ½ T -> _____ ω   2 r & 8 v -> _____ ω

     ⅓ r -> _____ ω   10 T -> _____ ω   ⅙ r & 4 T -> _____ ω

10. A car on an amusement park ride that has a radius of 20 m makes one lap around the circle in 60 seconds.
        A) Calculate the tangential speed of the car.

        B) Calculate the angular (aka rotational) speed in rad/sec.

11. A 2 kg rock is spun in a circle on the end of a string and makes a revolution every 2.09 s. What is the rotational (aka angular) speed?

12. In the kid's game of crack the whip, if all the kids have the same angular speed, why is the last kid in line going so fast?