Part B: Angular Velocity

Angular Velocity

- angular velocity is a measurement of how fast something spins around.

- angular velocity is represented by a lower case Greek letter omega (ω)

- the lower case omega is NOT the same thing as the letter "w"

- angular velocity is a vector

- the SI unit of angular velocity is radians per second
- because radians are dimensionless, the dimension is technically 1/s.

Formula for normal (linear) Velocity

$$\text{velocity} = \frac{\Delta x}{\Delta t} = \frac{\text{displacement}}{\text{time}}$$

Formula for Angular Velocity

$$\text{angular velocity} = \frac{\Delta \theta}{\Delta t} = \frac{\text{angular displacement}}{\text{time}}$$

Rotational Kinematics Name _____

The most common way to measure *angular velocity* is to find the time for *one single rotation*.
A single rotation has a *angular displacement* of 2π radians.

1. Someone runs all the way around a circle in a time of 15 seconds.
What is her angular velocity?

2. Someone runs all the way around a circle in a time of 90 seconds.
What is her angular velocity?

3. Someone runs halfway around a circle in a time of 12 seconds.
What is her angular velocity?

4. A super fast rabbit runs halfway around a circle in a time of 2 seconds.
What is her angular velocity?

5. A kid runs a quarter of a circle in a time of 18 seconds.
What is her angular velocity?

6. A football spins around 20 times in only 3 seconds.
What is its angular velocity

7. A football spins around 40 times in only 5 seconds.
What is its angular velocity?