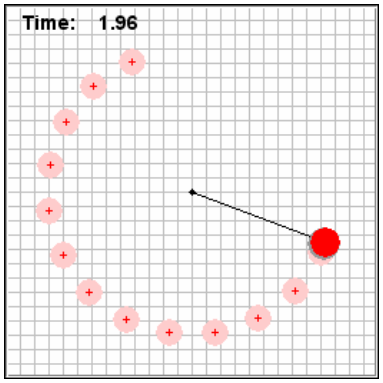
Worksheet for Exploration 10.1: Constant Angular Velocity Equation



By now you have seen the equation: $\theta = \theta_0 + \omega_0 * t$. Perhaps you have even derived it for yourself. But what does it really mean for the motion of objects? This Exploration allows you to explore both terms in the equation: the initial angular position by changing θ_0 from 0 radians to 6.28 radians and the angular velocity term by changing ω_0 from -15 rad/s to 15 rad/s. Restart.

Answer the following questions **(position is given in meters and time is given in seconds)**.

a. How does changing the initial angular position affect the motion?

b. How does changing the initial angular velocity affect the motion?

Additional Questions

Several measurable quantities are related. Use the equation given above for your settings of initial angular position, and initial angular velocity (ω_0) and complete the tables below In the table ΔS means the net displacement around the circle (in meters, not angle), and v_{tang} means the tangential velocity the ball has going around the circle.

i. In addition to filling out the table, label an example of what is meant by the initial angular position, angular displacement, and displacement on the figure.

ω_o=____	θ_o	θ_t	$\Delta\theta_t$	Δs	v_{tang}
t1=____					
t2=____					

Select a new initial angular speed and repeat.

ω_o=____	θ_o	θ_t	$\Delta\theta_t$	Δs	v_{tang}
t1=____					
t2=____					