

Name: _____

Date: _____

Section C D F

Rotational Motion I

1. A girl sits on a merry go round at a distance of 1.5 m from the center. If the girl moves through an arc length of 2.5 m, through what angular displacement does she move?
 - b. What measurement is this in degrees?

2. A passenger cart on a ferris wheel moves through a distance of 12 m before it stops to drop off passengers. If the passenger carts are all 35 m from the axis of rotation of the Ferris wheel, what angular displacement does each cart move through during this part of the ride?
 - b. What measurement is this in degrees?

3. A car tire rotates counterclockwise 3.5 times during a time interval of .75 seconds. What is the angular speed of the tire?
 - b. Calculate the angular speed in revolutions per minute.

4. A girl ties a toy airplane to the end of a string and swings it around her head. What is the plane's angular speed if that plane moves through an angular displacement of 3.3 rad during 1.5 s?

5. A figure skater begins spinning counterclockwise at an angular speed of 4.0π rad/s. During a 3.0s interval, she slowly pulls her arms inward and finally spins at 8.0π rad/s. What is her average angular acceleration during this time interval?

6. While pitching, a softball pitcher swings the ball with an angular speed of 10.5 rad/s. If the pitcher's arm is .66 m long, what is the tangential speed of the ball just before the pitcher releases it?

7. An athlete spins in a circle before letting go of a discus. If the athlete spins at an angular speed of 12.3 rad/s and holds the discus at a distance of .75 m from the center of the torso, what is the discus's linear speed (tangential speed) when the athlete releases it?

8. A young boy swings a yo-yo horizontally above his head at an angular acceleration of $.35 \text{ rad/s}^2$. If the yo-yo string is .5 m long, what is the tangential acceleration of the yo-yo at the end of the string?