Worksheet Math 1316 -Plane Trigonometry

Unit 2: Section 3.4- Linear & Angular Speed

Formulas:

Arc Length Formulas:

1.

2.

Liner Speed Formulas:

1.

2.

Why?

Angular Speed Formulas:

1.

2.

When solving problems always use _____ unless specified

Converting Problems:

The Earth completes **1 full rotation** in **24 hours**.
The radius of the Earth is **6400 km**.

1. Convert the angular speed to **radians per hour**.

2. Find the **linear speed** (km/hr) at the Earth's surface.

A space station completes **3 rotations in 6 hours**.
The radius of its circular path is **8000 km**.

1. Convert the angular speed to **radians per hour**.

2. Find the linear speed in **km/hr**.

A planet completes **5 revolutions in 10 hours**.
The radius of the planet is **9,000 km**.

1. Find the angular speed in **radians per hour**.

2. Find the linear speed at the surface.

Practice Problems:

1) A circle has a radius of 4 inches. Find the length of the arc intercepted by the central angle of 240°

2) Find the distance between the cities. Assume that Earths sphere has radius of 3960 miles and the cities are on the same longitude (one city is due north of the other)

City 1: 26° S

City 2: 31° N

3) A wheel of a radius is 14 in. and is rotating at a speed of 0.5 radians/sec

Find: the angular speed in revolution per minute (RPM)

Find: the linear speed in inches/seconds