

§4.1B: DMS, Linear and Angular Speed

“I WILL...

...solve for DMS, Arc Length and Linear/Angular Speed”

I. Steps in Writing in Decimal Form

- A. Keep the first digits in degree form
- B. Label the second number over \_\_\_\_\_ and convert the second number into a decimal
- C. Label the third number over \_\_\_\_\_
- D. Add the digits together and label as degrees
- E. If the given is negative, exclude the negative until the end

Ex 1: Convert  $36^\circ 14' 29''$  to decimal form. Round to 4 decimal places.

Ex 2: Convert  $-5^\circ 57' 36''$  to decimal form. Round to 4 decimal places.

Your Turn: Convert  $35^\circ 15' 27''$  to decimal form. Round to 4 decimal places.

II. Steps in Writing in Degree Form

- A. Keep the first digits in degree form
- B. Multiply the last numbers with the decimal (behind the degrees) by 60
- C. Take the decimals from the previous answer in step 2 and multiply by \_\_\_\_\_ again

Ex 3: Convert  $48.3625^\circ$  to DMS form.

Ex 4: Convert  $13.12345^\circ$  to DMS form.

Your Turn: Convert  $43.5525^\circ$  to DMS

III. Angular Speed

- A. Angular Speed applies to any object or particle that turns; angle through with the point *rotates* over time (also known as angle rotation)
- B. Angular Speed Equation:  $\frac{Angle}{Time} = \omega = \underline{\hspace{2cm}}$

Ex 5: The blades of the wind turbine are 116 feet long. The propeller rotates at 15 revolutions per minute. Find the angular speed.

Ex 6: A Ferris wheel at a carnival has a diameter of 52 feet. Suppose it turns at a rate of 2 revolutions per minute. Determine the angular speed.

Your Turn: The circular blade on a saw rotates at 4,200 revolutions per minute. Determine the angular speed of radians per second.

#### IV. Linear Speed

- A. Linear speed applies to any object or particle that moves; distance that the point *travels* over time (distance)
- B. Linear Speed Equation:  $\frac{\text{Arc Length}}{\text{Time}} = V = \text{_____}$  where  $\omega = \text{—}$  is angular speed
- C. Therefore, Linear Speed is also known as (Radius) \* (Angular Speed)
- D. Leave answers in radian mode

Ex 7: The blades of the wind turbine are 116 feet long. The propeller rotates at 15 revolutions per minute. Find the linear speed.

Ex 8: A merry go round makes 8 revolutions per minute. The horse 12 feet from the center is traveling with a radius of 12. How fast is the horse going in miles per hour?

Your Turn: The circular blade on a saw rotates at 4,200 revolutions per minute. Find the linear speed where the blade is 6 inches.