- Formula for Arc Length: $l = \theta r$ $\frac{arc}{360} \cdot 2\pi r$ or $\frac{rad}{2\pi} \cdot 2\pi r$ radians·radius

θ=radians r=radius

20._____ Find the measure of the central angle of a circle with radius 75ft and arc length of 60ft.

$\frac{60}{75} = \frac{75\theta}{75}$ $60 = 75 \times$

$.8 = \theta$ what does that mean $\frac{60}{75} = \frac{4}{5}$ or .8 radians

- Formula for Angular Speed: $AS = \frac{\theta}{t}$ ~~degrees~~ or radians / sec radians = 2π

- Formula for Linear Speed: $LS = \frac{r\theta}{t}$ or $LS = AS \cdot r$ circumference = $2\pi r$ ~~miles~~ sec
  - Notice, it is the same as the angular speed formula but multiplied by r.

21.A lawn roller with a 10-inch radius makes 1.2 revolutions per second.

every revolution = 2π radians

a. $\frac{1.2 \cdot 2\pi}{sec} = 2.4\pi$ rad/sec So _____ Find the angular speed of the roller in radians per second:

b. $\frac{r\theta}{t} = \frac{10 \cdot 2.4\pi}{sec}$ $24\pi \frac{in}{sec} \approx 75.398$ in/sec. _____ Find the linear speed of the tractor that is pulling the roller:

22.A car has tires with a 20 inch diameter and they turn at 1.5 revolutions per second. r = ?

$1.5 \cdot 2\pi$ = angle rotated

3π =

a. $\frac{3\pi \text{ rad}}{sec} \cdot \frac{60 \text{ sec}}{1 \text{ min}}$ _____ Find the angular speed of the tire in radians per minute:

180π rad/min

b. $180\pi \cdot 10 = 1800\pi$ in/min _____ How fast is the car traveling down the road?:

$LS = AS \cdot r$

Could you convert this to mph

12 in = 1 ft

5280 ft = 1 mi

60 mi = 1 hr.

$\frac{1800\pi \text{ in}}{1 \text{ min}} \cdot \frac{60 \text{ mi}}{1 \text{ hr}} \cdot \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{1 \text{ mi}}{5280 \text{ ft}}$