

8.1 Describing Rotational Motion

Revolution = $2\pi r$

- ① Degrees 360° deg
- ② Gradient 400 grad.
- ③ Radians 2π rad

why? 2π
 $C = 2\pi r$

- ① $r = 31.5\text{cm}$ bicycle tire
- ② 1 revolution = 198cm
- ③ $C = 197.9\text{cm}$
 $2\pi(31.5)$
 $\frac{198}{2\pi} = 31.51\text{cm}$

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$360^\circ = 2\pi$

$180^\circ = \pi$

$90^\circ = \frac{\pi}{2}$

$45^\circ = \frac{\pi}{4}$

$60^\circ = \frac{\pi}{3}$

$30^\circ = \frac{\pi}{6}$

Deg. $\frac{\pi}{180}$

Arc length = meters

$S = \theta \cdot r$

Radians



$\theta = \frac{S}{r}$

Angular displacement (theta)

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$\theta = 57.3^\circ$
 $r = 81.0\text{m}$
 How far did Billy travel on the ferris wheel?
 81.006m $S = \theta \cdot r$
 $57.3 \cdot \frac{\pi}{180} \cdot 81$
 Billy travels 230m
 $r = 81.0\text{m}$
 $\theta = 2.84\text{rad}$ $\theta = \frac{S}{r} = \frac{230}{81}$

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(#2) If you have angular displacement of 1.30 rad , and a radius of 2.0m , How far would you travel?
 $1.3 \cdot 2.0 = 2.6\text{m}$
 $\theta \cdot r =$

(#3) Convert θ from #2 to degrees.
 $\frac{\pi}{180} = \text{Radians}$
 138.430

$\frac{180}{1.3} = 148.97$
 $148.97 \cdot 1.3 = 193.68$
 $1.3 \cdot \frac{180}{\pi} = 74.48$

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