Week 10 Tuesday

March 12, 2019 7:55 AM

Quiz

a) $\log_6 \frac{1}{36}$

$= -2$

$6^{\boxed{-2}} = \frac{1}{36}$

b) $\log_7 1$

$= 0$

$7^{\boxed{0}} = 1$

c) $\ln e^{2x}$

$= \log_e e^{2x}$

$= 2x$

$e^{\boxed{2x}} = e^{2x}$

Alternatively: $\ln x$ and e^x are inverse functions

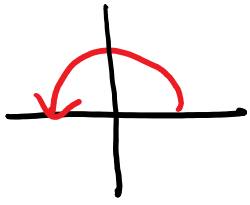
$\ln e^{?} = ?$

Quiz Tues 19th 6.6

Ch 7 Trig

7.1 Angles Cont'd

Recall: a half rotation is 180° or π radians



$180° = \pi$ radians

$$180^\circ = \pi \text{ radians}$$

Ex: Convert between degrees and radians

a) $\frac{2\pi}{3}$ radians

$$= \frac{2\pi}{3} \text{ rad} \times \frac{180^\circ}{\pi \text{ rad}} \quad \left(\frac{180^\circ}{\pi \text{ rad}} \neq 1\right)$$

$$= \frac{2 \cdot 180^\circ}{3}$$

$$= 120^\circ$$

b) 1.1 rad

$$= 1.1 \text{ rad} \times \frac{180^\circ}{\pi \text{ rad}}$$

$$= \frac{1.1(180)}{\pi}^\circ$$

$$\approx 63^\circ$$

c) 225°

$$= 225^\circ \times \frac{\pi \text{ rad}}{180^\circ}$$

$$= \frac{225\pi}{180} \text{ rad}$$

$= \frac{5(45)\pi}{4(45)}$ rad

$= \frac{5\pi}{4}$ rad or $\frac{5\pi}{4}$

d) $19°$

$= 19° \times \frac{\pi \text{ rad}}{180°}$

$= \frac{19\pi}{180}$ rad

≈ 0.33 rad

Know these ⭐

Common Angles

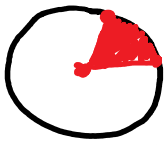
Degrees	$0°$	$30°$	$45°$	$60°$	$90°$	$180°$	$360°$
Radians	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	2π

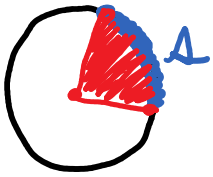
Semi-Common Angles

Degrees $270°$ $225° = 180° + 45°$

Radians $\frac{3}{4}(2\pi) = \frac{3\pi}{2}$ $\pi + \frac{\pi}{4} = \frac{5\pi}{4}$

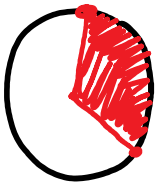
Sector of a circle





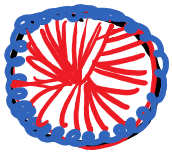
Arclength $s = r\theta$

(On formula sheet)



Area $A = \frac{1}{2}r^2\theta$

Why? Imagine a full rotation $\theta = 2\pi$

a) 

Arclength = Circumference

$= 2\pi r$

$s = r\theta$

b) 

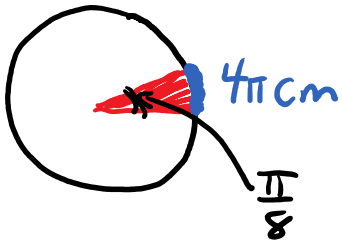
$A = \pi r^2$

$A = \frac{1}{2}\theta r^2$

$A = \frac{1}{2}r^2\theta$

Ex: Angle of $\frac{\pi}{8}$ subtends an arc

of length 4π cm. Radius of circle?



$s = r\theta$ ← must be in radians ✓

$4\pi = r\left(\frac{\pi}{8}\right)$

$4\pi \times \frac{8}{\pi} = r$

$32 \text{ cm} = r$