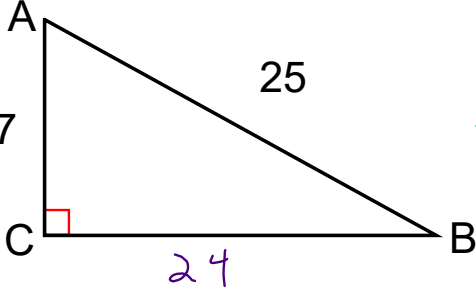


AP Calculus

Chapter 1

Section 1-6

May 13-10:02 PM



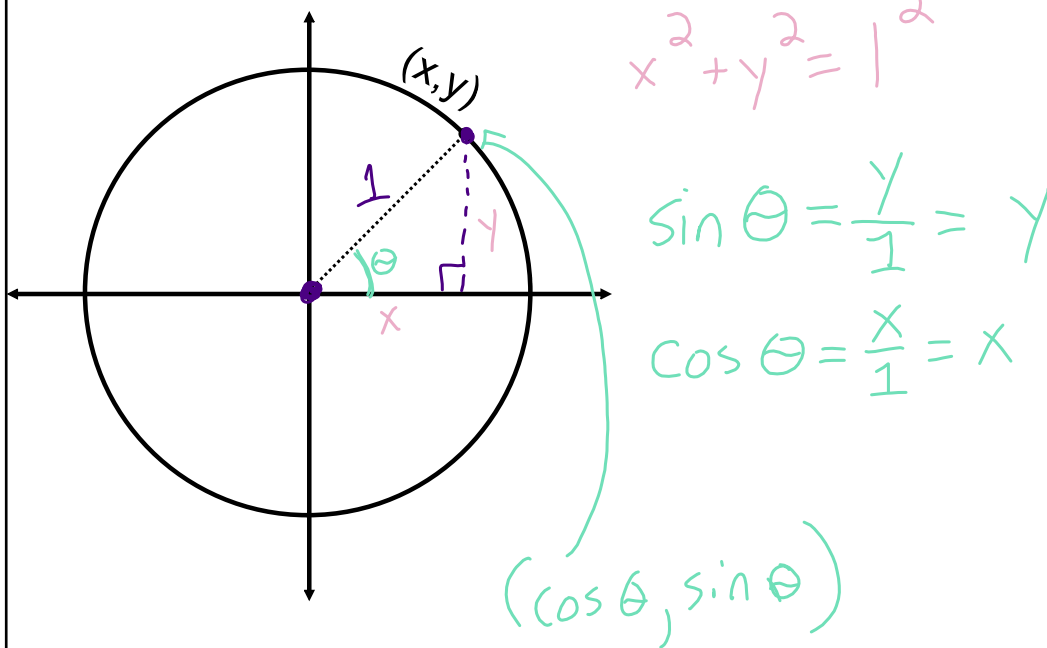
$a^2 + b^2 = c^2$
 $7^2 + b^2 = 25^2$
 $b = 24$

Find the values of all six trigonometric ratios for angles A and B

$\sin = \frac{O}{H}$ $\sin A = \frac{24}{25}$ $\sin B = \frac{7}{25}$
 $\cos = \frac{A}{H}$ $\cos A = \frac{7}{25}$ $\cos B = \frac{24}{25}$
 $\tan = \frac{O}{A}$
 $\csc = \frac{H}{O}$
 $\sec = \frac{H}{A}$
 $\cot = \frac{A}{O}$

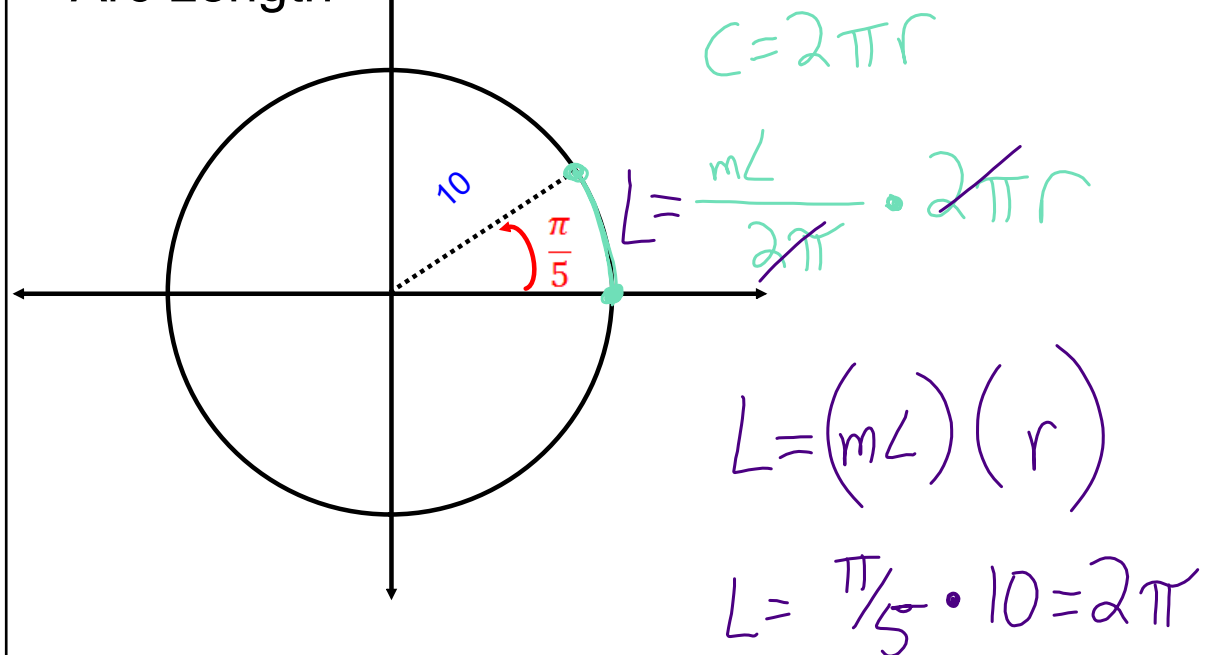
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Unit Circle



Aug 27-8:33 AM

Arc Length



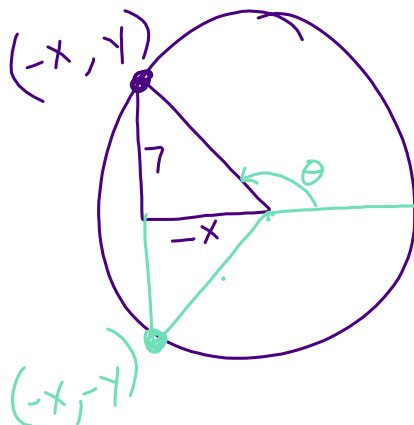
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Using Trigonometric Values

Determine the sine ratio of θ .

$$\cos(\theta) = -\frac{7}{25}, \tan(\theta) > 0$$

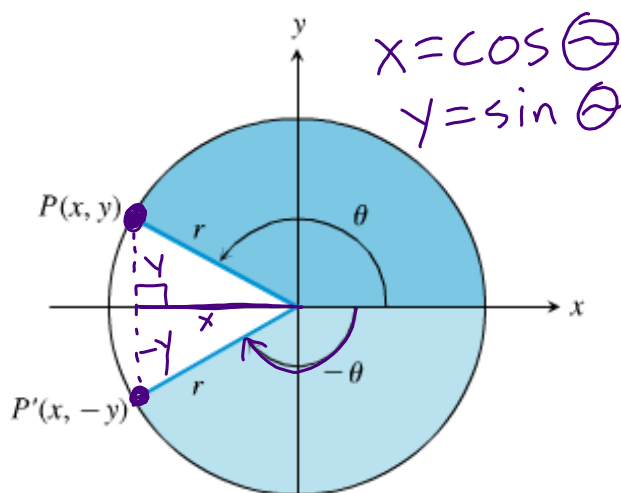
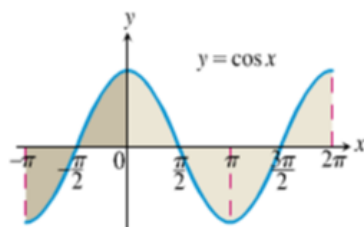
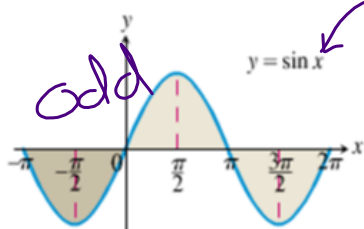
$$+ \tan \theta = \frac{\sin \theta}{\cos \theta}$$



$$\sin \theta = -\frac{24}{25}$$

May 13-10:44 PM

Even and Odd



$$x = \cos \theta$$

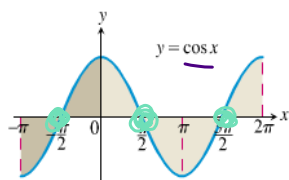
$$y = \sin \theta$$

$$f(-x) = f(x)$$

$$f(-x) = -f(x)$$

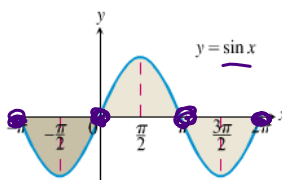
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Trigonometric Functions



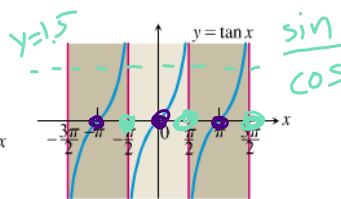
Domain: $-\infty < x < \infty$
 Range: $-1 \leq y \leq 1$
 Period: 2π

(a)



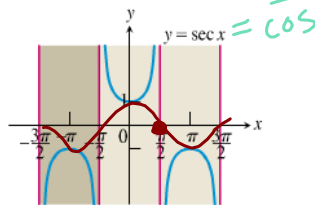
Domain: $-\infty < x < \infty$
 Range: $-1 \leq y \leq 1$
 Period: 2π

(b)



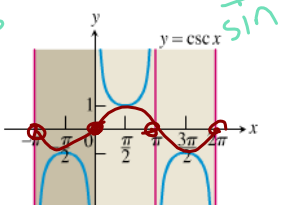
Domain: $x \neq \pm \frac{\pi}{2}, \pm \frac{3\pi}{2}, \dots$
 Range: $-\infty < y < \infty$
 Period: π

(c)



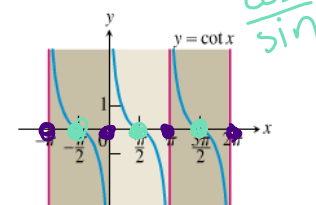
Domain: $x \neq \pm \frac{\pi}{2}, \pm \frac{3\pi}{2}, \dots$
 Range: $y \leq -1$ and $y \geq 1$
 Period: 2π

(d)



Domain: $x \neq 0, \pm\pi, \pm 2\pi, \dots$
 Range: $y \leq -1$ and $y \geq 1$
 Period: 2π

(e)



Domain: $x \neq 0, \pm\pi, \pm 2\pi, \dots$
 Range: $-\infty < y < \infty$
 Period: π

(f)

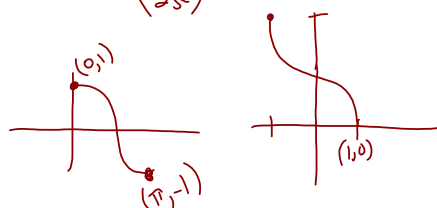
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DEFINITIONS Inverse Trigonometric Functions

Function	Domain	Range
$y = \cos^{-1} x$	$-1 \leq x \leq 1$	$0 \leq y \leq \pi$
$y = \sin^{-1} x$	$-1 \leq x \leq 1$	$-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$
$y = \tan^{-1} x$	$-\infty < x < \infty$	$-\frac{\pi}{2} < y < \frac{\pi}{2}$
$y = \sec^{-1} x$	$ x \geq 1$	$0 \leq y \leq \pi, y \neq \frac{\pi}{2}$
$y = \csc^{-1} x$	$ x \geq 1$	$-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}, y \neq 0$
$y = \cot^{-1} x$	$-\infty < x < \infty$	$0 < y < \pi$

$\sin A = \frac{7}{25}$

$A = \sin^{-1}\left(\frac{7}{25}\right)$



Aug 25-1:22 PM

Inverse Trigonometry

Solve the equation for the given interval.

*round to 3 decimal places

$$\tan x = 1.5, \quad -4 < x < 4$$

$$x = \tan^{-1}(1.5) \approx .98$$

$$.98 + \pi > 4$$

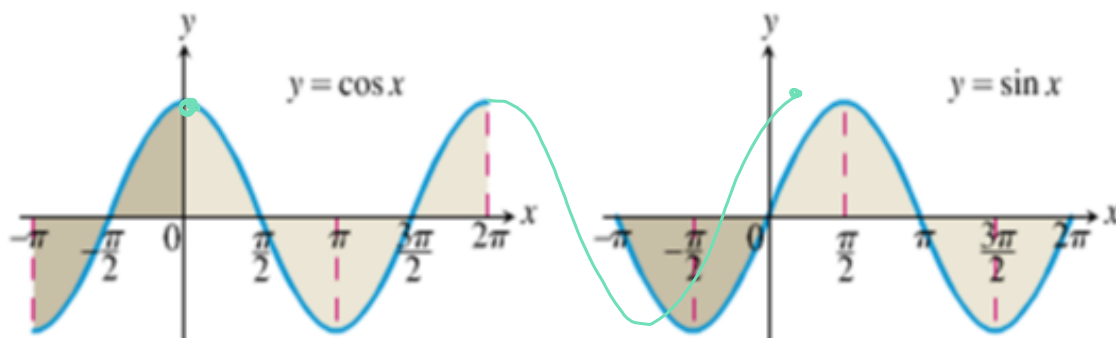
$$.98 - \pi \approx -2.16$$

$$x \approx .98, -2.16$$

Aug 24-12:27 PM

DEFINITION Periodic Function, Period

A function $f(x)$ is **periodic** if there is a positive number p such that $f(x + p) = f(x)$ for every value of x . The smallest such value of p is the **period** of f .



Aug 27-8:44 AM

Transforming Trigonometric Functions

$$f(\theta) = \sin(\theta) \quad \text{parent}$$

$$f(\theta) = 4\sin(\theta) \quad \text{vert stretch (amplitude)}$$

$$f(\theta) = \sin(2\theta) \quad \text{horizontal compress}$$

$$f(\theta) = \sin\left(\theta + \frac{\pi}{2}\right) \quad \text{horiz. shift (left)}$$

$$f(\theta) = \sin(\theta - 2\pi) \quad \text{no change}$$

$$f(\theta) = \sin(\theta) - 3 \quad \text{vert shift (down)}$$

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Homework

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1 - 19 odd, 31 - 41 odd, 52, 53, 54

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