Main Ideas/Questions	Notes
Trigonometric Identities	• A **trigonometric identity** is an equation involving trigonometric functions that is true for all values for which every expression in the equation is defined. • The identities help to evaluate functions, simplify expressions, prove identities, and solve equations.

Fundamental Trigonometric Identities

$x^2+y^2=r^2$

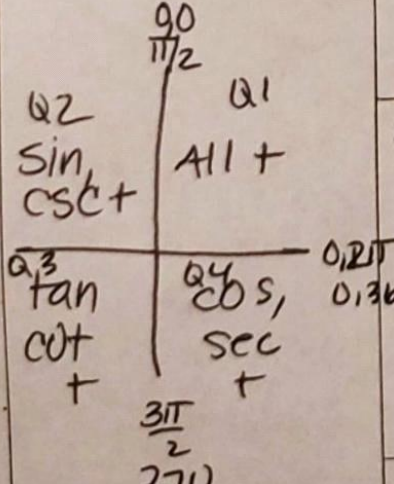
$\sin\theta=\frac{y}{r}$ $\csc\theta=\frac{r}{y}$

$\cos\theta=\frac{x}{r}$ $\sec\theta=\frac{r}{x}$

$\tan\theta=\frac{y}{x}$ $\cot\theta=\frac{x}{y}$

Quotient Identities	$\tan\theta=\frac{\sin\theta}{\cos\theta};\ \cos\theta\neq 0$	$\cot\theta=\frac{\cos\theta}{\sin\theta};\ \sin\theta\neq 0$	
Reciprocal Identities	$\sin\theta=\frac{1}{\csc\theta};\ \csc\theta\neq 0$	$\csc\theta=\frac{1}{\sin\theta};\ \sin\theta\neq 0$	
	$\cos\theta=\frac{1}{\sec\theta};\ \sec\theta\neq 0$	$\sec\theta=\frac{1}{\cos\theta};\ \sec\theta\neq 0$	
	$\tan\theta=\frac{1}{\cot\theta};\ \cot\theta\neq 0$	$\cot\theta=\frac{1}{\tan\theta};\ \tan\theta\neq 0$	
Pythagorean Identities	$\cos^2\theta+\sin^2\theta=1$	$\tan^2\theta+1=\sec^2\theta$	$\cot^2\theta+1=\csc^2\theta$

Finding Trig Function Values



1. Find the exact value of $\sin\theta$ if $\cos\theta=-\frac{4}{7}$ and $\frac{\pi}{2}<\theta<\pi$. Q2

$x=-4$ $y=\sqrt{33}$ $r=7$

$x^2+y^2=r^2$

$(-4)^2+y^2=7^2$

$16+y^2=49$

$y^2=49-16$

$y=\sqrt{33}$

$+\sin\theta=\frac{\sqrt{33}}{7}$ $+\csc\theta=\frac{7\sqrt{33}}{33}$

$-\cos\theta=-4/7$ $-\sec\theta=-\frac{7}{4}$

$-\tan\theta=-\frac{\sqrt{33}}{4}$ $-\cot\theta=\frac{-4\sqrt{33}}{33}$

2. Find the exact value of $\cos\theta$ if $\cot\theta=\frac{2}{5}$ and $180<\theta<270°$. Q3

$x=2,\ y=5,\ r=\sqrt{29}$

$x^2+y^2=r^2$

$2^2+5^2=r^2$

$4+25=r^2$

$\sqrt{29}=\sqrt{r^2}$

$r=\sqrt{29}$

$-\cos\theta=-\frac{2}{\sqrt{29}}=-\frac{2\sqrt{29}}{29}$

3. Find the exact value of $\tan\theta$ if $\csc\theta=-\frac{2}{1}$ and $\frac{3\pi}{2}<\theta<2\pi$. Q4

$x=\sqrt{3}$ $y=-1$ $r=2$

$x^2+y^2=r^2$

$x^2+(-1)^2=2^2$

$\sqrt{x^2}=\sqrt{3}$

$x=\sqrt{3}$

$\tan\theta=-\frac{1}{\sqrt{3}}=-\frac{\sqrt{3}}{3}$