

Calculators cannot be used. In all problems show your work, put a box around your answer and clearly label it. Put your name, your TA's name, your discussion time, and your UIN on **both pages** of the exam. You can show your clearly labeled work on the back of either sheet.

1. (a) Fill in all boxes of the table with EXACT values.

θ degrees	θ radians	$\sin(\theta)$	$\cos(\theta)$	$\tan(\theta)$
0				
30				
45				
60				
90				

- (b) In the boxes list ALL quadrants in which the given function is POSITIVE.

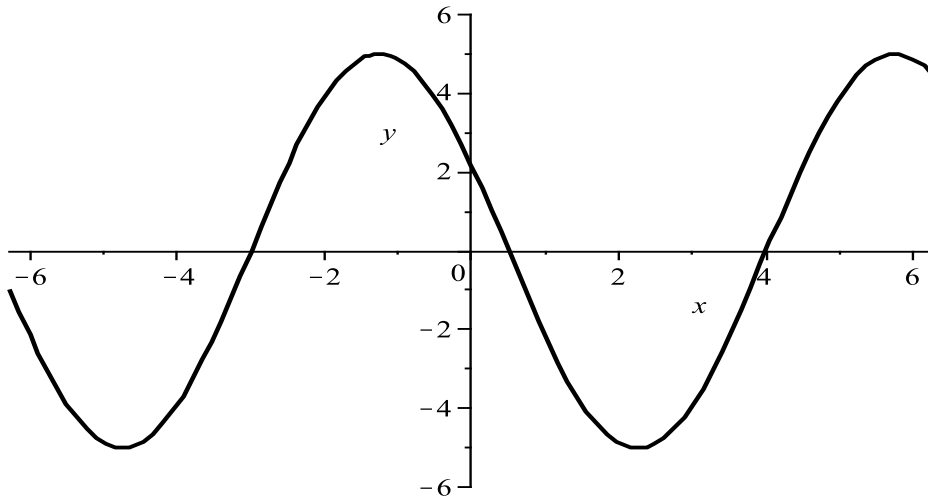
function	I, II, III, IV
$\sin(\theta)$	
$\cos(\theta)$	
$\tan(\theta)$	

2. In the boxes complete the trigonometric identities as given in lectures

left side of identity	right side of identity
$\sin(x + y) =$	
$\cos(x + y) =$	
$\sin(2x) =$	
$\cos(2x) =$	
$\sin^2(x) =$	
$\cos^2(x) =$	

3. Given $y = A \sin(bt + c) = A \sin(b(t - t_0))$ Find:

- period = $T =$ _____
- angular frequency = $b = \frac{2\pi}{T} =$ _____
- phase shift = $t_0 =$ _____
- phase constant = $c =$ _____
- phase = $bt + c =$ _____



4. A wheel with radius $r = 20\text{cm}$ is rolling at a speed of 3km/hr . What is ω , the *angular speed*, in radians per hour? Show all work, including units, for full credit. $1\text{km} = 1000\text{m}$ and $1\text{m} = 100\text{cm}$.

Show clearly labeled work for problems 5, 6 and 7 on the back of the exam sheets.

5. Give the EXACT value of $\sin\left(\frac{7\pi}{12}\right)$
6. If $\cot(\theta) = -\frac{3}{2}$ and $\cos(\theta) < 0$, find $\cos(\theta)$
7. Find an algebraic expression in v for the expression $\tan(\sin^{-1} v)$