TRIGONOMETRY I REVIEW

In all possible cases, exact values should be used. Radian measures which are not exact should be to three decimal places. Otherwise answers should be to 2 decimal places.

1. Convert to radians:

   a) 105° _____ b) 400°_____ c) 40°_____ d) 10°_____

2. Convert to degrees:

   a) $\frac{13\pi}{12}$ _____ b) 0.800_____ c) −7.500_____ d) $\frac{7\pi}{5}$ _____

3. Determine the reference angle for:

   a) $\frac{7\pi}{5}$ _____ b) −1.000 _____

4. Find 2 coterminal angles for each of the above (in question 3)

   a) _____ b) _____

5. A fan at high speed is turning at 220 rpm. Convert this speed to radians per second.

6. The earth has a radius of 6.38×10^6 m, and completes one full rotation about its axis every 24 hours.

   a) Determine your angular speed.

   b) How far will you travel in one minute?

7. Find the diameter of a pizza slice with central angle of 1.50 radians and area of 170 cm^2.

8. The terminal angle of an angle θ in standard position passes through the point (3, −8). Determine:

$\sin\theta$	$\csc\theta$
$\cos\theta$	$\sec\theta$
$\tan\theta$	$\cot\theta$
$\theta\ (0 < \theta < 2\pi)$	

9. If $\csc\theta = -\frac{5}{4}$, and θ lies in quadrant III, determine cos θ.

10. Complete the table with exact trig ratios:

	$\frac{2\pi}{3}$	$\frac{5\pi}{4}$	$\frac{3\pi}{2}$	$\frac{5\pi}{3}$
$\sin\theta$				
$\cos\theta$				
$\tan\theta$				
$\csc\theta$				
$\sec\theta$				
$\cot\theta$				

11. Solve, $0 \le \theta < 2\pi$:

a) $\sin\theta = -\frac{1}{\sqrt{2}}$ _____

b) $\cot\theta = \sqrt{3}$ _____

c) $\sec\theta = -2$ _____

d) $\sin\theta = 0.600$ _____

e) $\tan\theta = 2.5$ _____

f) $\cos\theta = 0.825$ _____

g) $\csc\theta = -\frac{2}{\sqrt{3}}$ _____

h) $\csc\theta = 0$ _____

i) $\cos\theta = -1$ _____

j) $\sec^2\theta = 2$ _____

12. For each of the following functions, state the amplitude, period, phase shift and vertical displacement:

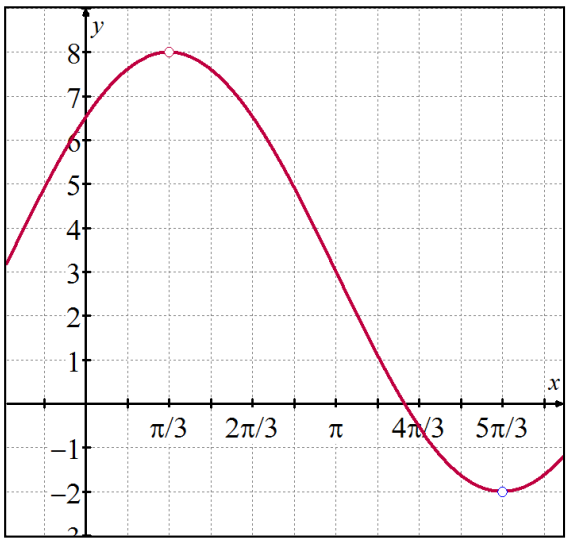
	Amplitude	Period	Phase shift	Vertical displacement
a) $y=-3\sin\left(2x+\frac{\pi}{3}\right)-5$				
b) $y=\sin\left(0.75\left(\theta-\frac{\pi}{4}\right)\right)$				
c) $y=-20\cos\left(\frac{2\pi}{120}(t+7)\right)+10$				
d) $y=2\tan 2x$				

13. Determine the equation of the sinusoidal function which has a minimum at (3, −5) and rises to the next nearest maximum at (21, 7).

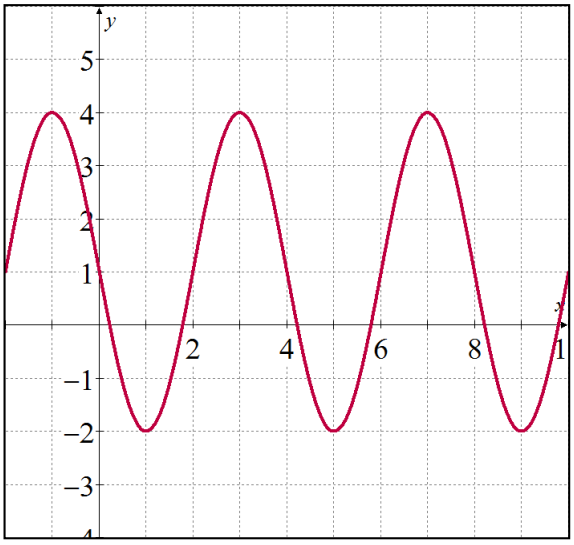
14. Determine the equation of the cosine function with the amplitude 2, period 5π, phase shift $\frac{\pi}{12}$ and vertical displacement −8.

For the next two questions, determine two possible equations to represent each function shown: (3 marks each)

15.



16.



17. The number of people skiing/snowboarding (P) at any time on a ski mountain can be modeled by a sinusoidal function. At 9:00 am there are 150 skiers on the hill, which is the minimum. The number of skiers peaks 7 hours later when there are 1050 skiers on the hill. The function is valid until 9:00 pm, when the hill shuts down for the night.

a) Sketch a graph of this function.

b) Determine an equation to represent this function, where t is the time in hours (midnight is zero hours, 9:00 p.m. is 21:00), and the hill is open from 9:00 am to 9:00 pm.

c) What is the earliest time (after 9:00 am) at which there will be 600 people on the mountain?

d) How many people are on the mountain at 12:00 noon?

d) For what time period(s) are there more than 800 skiers on the hill? (intended to require graphing technology).

18. Using graph paper, sketch at least one complete period of the functions in question 12.