<u>Unit #4 – Trigonometry One – Exam Review</u>

1. Find the exact value of each trigonometric ratio.

   a) $Sin\left(\dfrac{7\pi}{6}\right)$ b) $Tan\left(\dfrac{5\pi}{3}\right)$ c) $Cos\left(\dfrac{7\pi}{4}\right)$ d) $Sec\left(\dfrac{11\pi}{6}\right)$ e) $Cot\left(\dfrac{5\pi}{4}\right)$ f) $Csc\left(\dfrac{2\pi}{3}\right)$

2. Solve the following for θ, $0 \le \theta \le 2\pi$. State exact answers.

   a) $Cos(\theta) = \dfrac{-1}{2}$

   d) $Sec(\theta) = \dfrac{2}{\sqrt{3}}$

   b) $Tan(\theta) = -\sqrt{3}$

   e) $Cot(\theta) = 1$

   c) $Csc(\theta) = -2$

   f) $Sin(\theta) = 0$

3. Solve the following for θ, $0 \le \theta \le 2\pi$. Round θ to 4 decimal places.

   a) $Sin(\theta) = -0.7956$
   d) $Csc(\theta) = 6.3861$

   b) $Cos(\theta) = 0.1353$
   e) $Tan(\theta) = 4.8367$

   c) $Cot(\theta) = -7.9684$
   f) $Sec(\theta) = -2.7634$

4. Graph the following, using transformations.

   a) $y = \dfrac{-2}{3} Cos\left[\dfrac{1}{3}\left(x + \dfrac{\pi}{4}\right)\right] + 2$

   b) $\dfrac{(y+3)}{5} = Sin\left[4\left(x - \dfrac{3\pi}{2}\right)\right]$

5. a) State the amplitude, period, phase shift, vertical translation, reflection in x-axis, range, intervals of increase and intervals of decrease for the following graphs.
   b) Find the equation using the given function.

i) Cosine

ii) Sine

iii) Sine

iv) Cosine
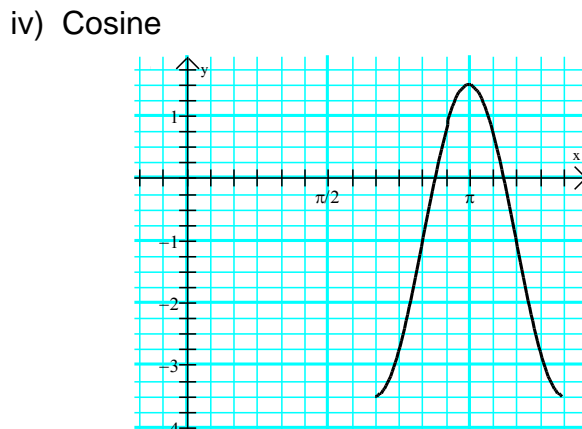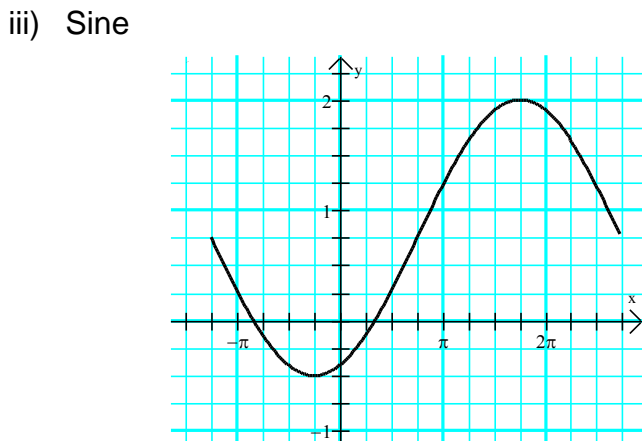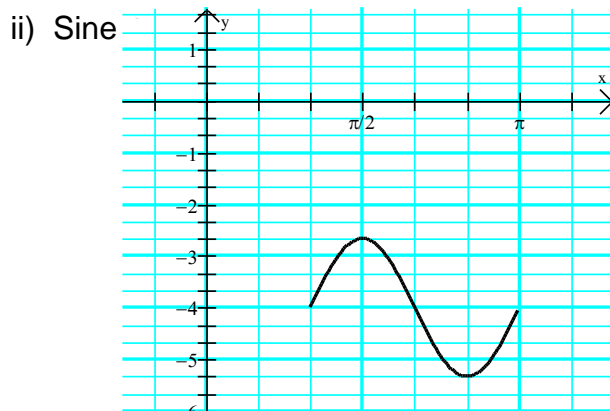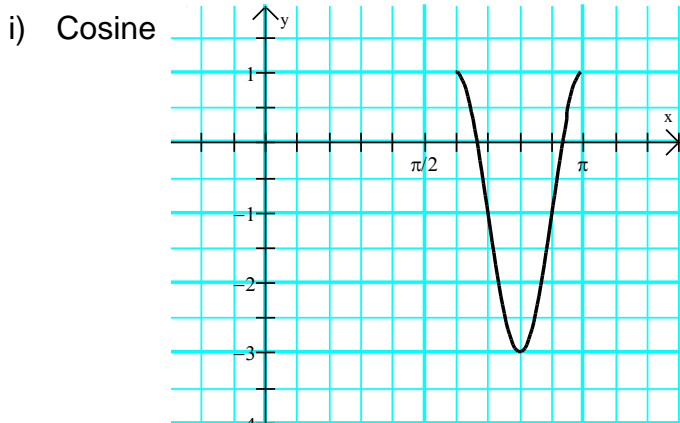
Answers:

1. a) $\dfrac{-1}{2}$ b) $-\sqrt{3}$ c) $\dfrac{1}{\sqrt{2}}$ d) $\dfrac{2}{\sqrt{3}}$ e) 1 f) $\dfrac{2}{\sqrt{3}}$

2. a) $\dfrac{2\pi}{3},\dfrac{4\pi}{3}$ b) $\dfrac{2\pi}{3},\dfrac{5\pi}{3}$ c) $\dfrac{7\pi}{6},\dfrac{11\pi}{6}$ d) $\dfrac{\pi}{6},\dfrac{11\pi}{6}$ e) $\dfrac{\pi}{4},\dfrac{5\pi}{4}$ f) $0,\pi,2\pi$

3. a) 4.0616 , 5.3632 b) 1.4351 , 4.8481 c) 3.0168 , 6.1584
   d) 0.1572 , 2.9844 e) 1.3669 , 4.5085 f) 1.9411 , 4.3421

5.

Property	i)	ii)	iii)	iv)
Amplitude	2	$\dfrac{4}{3}$	$\dfrac{5}{4}$	$\dfrac{5}{2}$
Period	$\dfrac{2\pi}{5}$	$\dfrac{2\pi}{3}$	4π	$\dfrac{2\pi}{3}$
Phase Shift	Right $\dfrac{3\pi}{5}$	Right $\dfrac{\pi}{3}$	Left $\dfrac{5\pi}{4}$	Right $\dfrac{2\pi}{3}$
Vert. Trans.	Down 1	Down 4	Up $\dfrac{3}{4}$	Down 1
Reflection	No	No	Yes	Yes
Range	$[-3,1]$	$\left[\dfrac{-8}{3},\dfrac{-16}{3}\right]$	$\left[\dfrac{-1}{2},2\right]$	$\left[\dfrac{-7}{2},\dfrac{3}{2}\right]$
Increase	$\left[\dfrac{4\pi}{5},\pi\right]$	$\left[\dfrac{\pi}{3},\dfrac{\pi}{2}\right],\left[\dfrac{5\pi}{6},\pi\right]$	$\left[\dfrac{-\pi}{4},\dfrac{7\pi}{4}\right]$	$\left[\dfrac{2\pi}{3},\pi\right]$
Decrease	$\left[\dfrac{3\pi}{5},\dfrac{4\pi}{5}\right]$	$\left[\dfrac{\pi}{2},\dfrac{5\pi}{6}\right]$	$\left[\dfrac{-5\pi}{4},\dfrac{-\pi}{4}\right],\left[\dfrac{7\pi}{4},\dfrac{11\pi}{4}\right]$	$\left[\pi,\dfrac{4\pi}{3}\right]$

i) $y = 2Cos\left[5\left(x-\dfrac{3\pi}{5}\right)\right]-1$

ii) $y = \dfrac{4}{3}Sin\left[3\left(x-\dfrac{\pi}{3}\right)\right]-4$

iii) $y = \dfrac{-5}{4}Sin\left[\dfrac{1}{2}\left(x+\dfrac{5\pi}{4}\right)\right]+\dfrac{3}{4}$

iv) $y = \dfrac{-5}{2}Cos\left[3\left(x-\dfrac{2\pi}{3}\right)\right]-1$