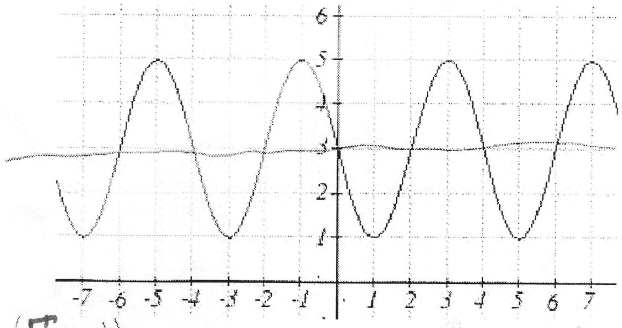
Practice Exam. See my work online

SHOW ALL WORK: Answers without adequate justification may not receive full credit. Give exact answers wherever possible. Given angle answers in radians unless otherwise specified.

1. (14pts) For graph to the right



   a. Amplitude: 2

   b. Midline: $y=3$

   c. Period: 4

   d. Equation using sine: $-2\sin\left(\frac{\pi}{2}(x)\right)+3$ or $2\sin\left(\frac{\pi}{2}(x-2)\right)+3$

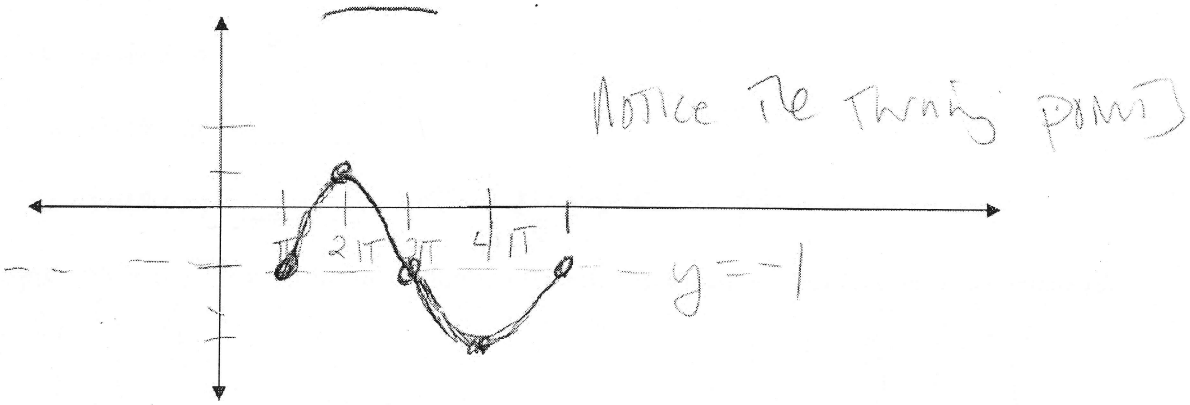
   e. Equation using cosine: $2\cos\left(\frac{\pi}{2}(x+1)\right)+3$ or $-2\cos\left(\frac{\pi}{2}(x-1)\right)+3$

2. (12pts) Given $f(t)=-2\sin\left(\frac{1}{2}(t-\pi)\right)-1$.

   a. Amplitude = 2 b. Midline = $y=-1$

   c. Period = $2\pi \cdot \frac{2}{1} = 4\pi$ d. Horizontal Shift = RT π

   e. Sketch at least one full cycle of the graph. Be sure to label the axes.



3. (10pts) Below is part of a tide table. Find an equation for $h(t)$, the height of the tide, where t is measured in hours after midnight.

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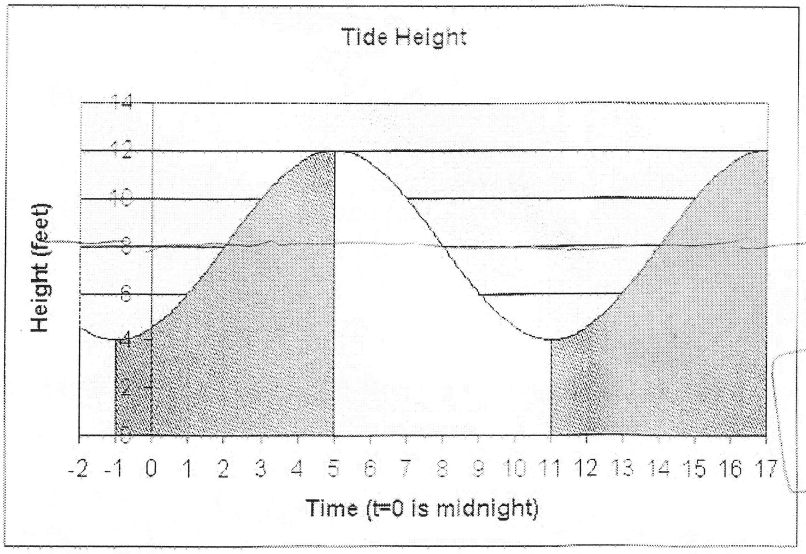


Amp 2
Left 1 or Rt 5
Cosine
Period = 12 hrs

$h(t) = -4\cos\left(\frac{\pi}{6}(x+1)\right)+8$

4. (5pts) If $\tan(\theta) = A$, $\sin(\theta) = B$, and $\cos(\theta) = C$, then:

   a. $\sin(-\theta) =$ $-\sin\theta = -B$

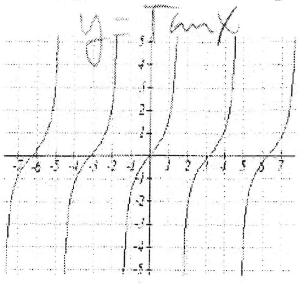
   b. $\tan(-\theta) =$ $-\tan\theta = -A$

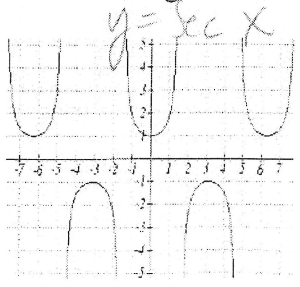
   c. $\sec(-\theta) =$ $\frac{1}{C}$

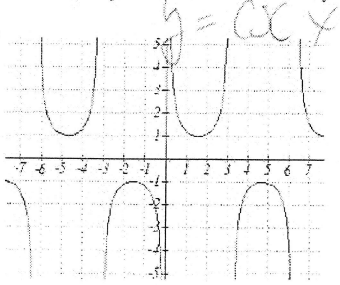
   d. $\csc(\theta + 2\pi) =$ Shifted Left one cycle $\frac{1}{B}$

   e. $\tan(\theta + \pi) =$ Shifted Left one cycle A

5. (3pts) Write the equation for the following BASIC trig functions *(they have not been transformed)*







6. (4pts) Evaluate each of the following.

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a) $\sin^{-1}\left(-\frac{1}{2}\right)$ $-\pi/6$

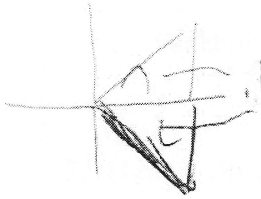
b) $\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)$ $3\pi/4$

7. (4pts) State the domain and range of $\sin^{-1}(x)$

D: $[-1, 1]$

R: $[-\pi/2, \pi/2]$

8. (4pts) Solve $\cos(\theta) = 0.2$ for all solutions $0 \le \theta < 2\pi$



$\arccos(.2) =$ 1.369

1.369

$\pi - 1.369 =$ 4.914

9. (8pts) Solve $2\sin\left(\frac{\pi}{3}t\right) = 1$ for the first three positive solutions.

$0 = 2\sin\left(\frac{\pi}{3}T\right) - 1$

$\sin\frac{\pi}{3}T = \frac{1}{2}$

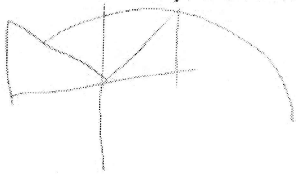
$\frac{\pi}{3}T = \frac{\pi}{6} + 2\pi k$ $\quad \frac{\pi}{3}T = \frac{5\pi}{6} + 2\pi k$

$T = \frac{1}{2} + 6k$ $\quad T = \frac{5}{2} + 6k$

$\frac{1}{2}, \frac{5}{2}, \frac{13}{2}$

10. (10pts) Solve $3\sin(4t) = 1$ for the first four positive solutions.

$\sin 4T = \frac{1}{3}$



$4T = .3398 + 2\pi k$ $\quad \pi - .3398$

$T = .08496 + \frac{\pi}{2}k$ $\quad 4T = 2.8018 + 2\pi k$

$T = .7004 + \frac{\pi}{2}k$

.08496, .7004, 1.6558, 2.271