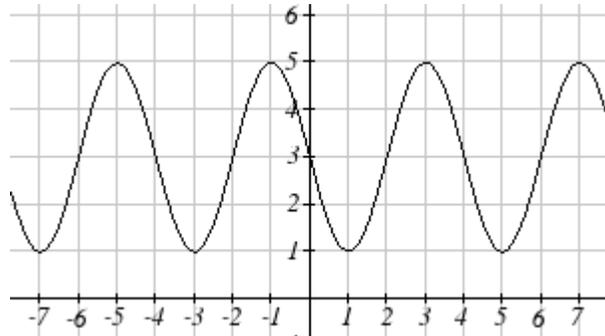


SHOW ALL WORK: Answers without adequate justification may not receive full credit. Give exact answers wherever possible. Given angle answers in radians unless otherwise specified.

1. (14pts) For graph to the right



a. Amplitude: _____

b. Midline: _____

c. Period: _____

d. Equation using sine: _____

e. Equation using cosine: _____

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

a. Amplitude = _____ b. Midline = _____

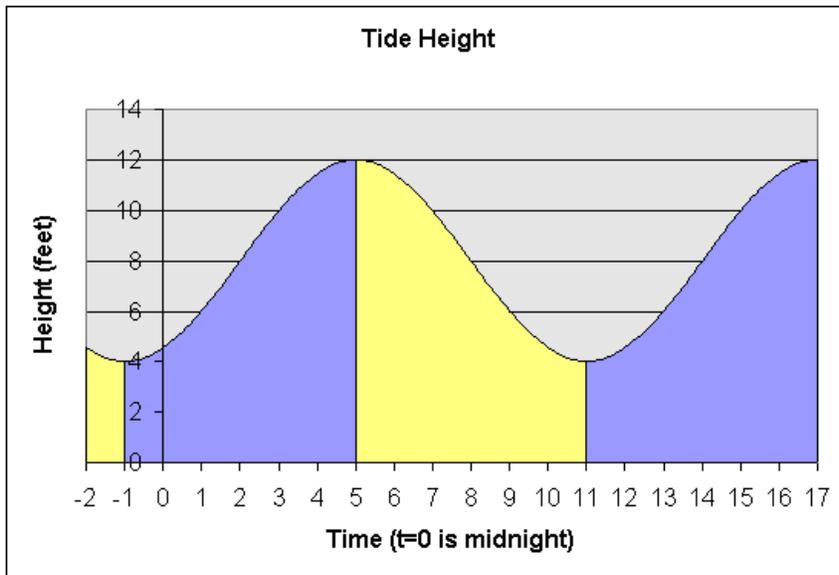
c. Period = _____ d. Horizontal Shift = _____



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



3.
 4. (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.



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

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

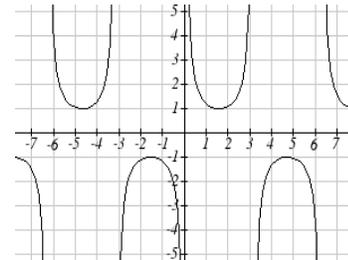
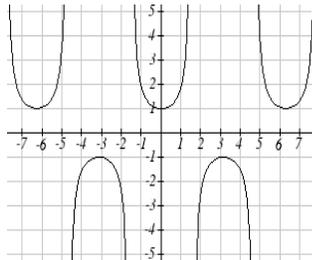
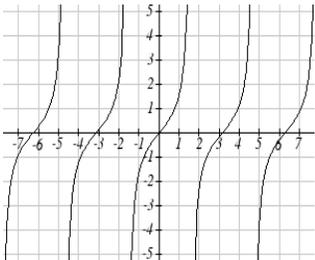
b. $\tan(-\theta) =$ _____

c. $\sec(-\theta) =$ _____

d. $\csc(\theta + 2\pi) =$ _____

e. $\tan(\theta + \pi) =$ _____

6. (3pts) Write the equation for the following BASIC trig functions (*they have not been transformed*)



7. (4pts) Evaluate each of the following.

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

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



8. (4pts) State the domain and range of $\sin^{-1}(x)$

D: _____

R: _____

9. (4pts) Solve $\cos(\theta) = 0.2$ for all solutions $0 \leq \theta < 2\pi$

10. (8pts) Solve $2 \sin\left(\frac{\pi}{3}t\right) = 1$ for the first three positive solutions.

11. (10pts) Solve $3 \sin(4t) = 1$ for the first four positive solutions.



12. (6pts) An airplane flies from Joint Base Lewis McChord (JBLM) to a undisclosed location 80 km south and 200 km east. In what direction should the plane fly?

The plane should fly _____ degrees south of east

13. (17pts) A vacationer sits all day on the corner of a pier in Boston Harbor and notices that at 9am, when the water level is at its lowest, the waters depth is 2 feet. At 4 pm, the water has risen to its maximum depth of 12 feet. If the depth of the water level varies sinusoidally,
- Find a formula for the depth of the water as a function of time, t , since 9am.

b. What is the water depth at 7pm?

c. Sketch a graph of your function showing at least one full period

