

- Exact answers are expected for every problem. For example, if your answer is $\frac{\sqrt{3}}{2}$, do not plug this into your calculator and report the answer as 0.866. Leave your answer as a radical.
- Be sure your calculator is set to the correct mode, DEGREES or RADIANS.

1. (20 pts) Compute the **EXACT** values of:

(a) $\sin 45^\circ$ (b) $\sin 22.5^\circ$ (c) $\cos\left(\frac{\pi}{12}\right)$

2. (20 pts) The terminal side of an angle t passes through the point $(-1, -2)$. Compute the **EXACT** values of:

(a) $\cos t$ (b) $\sin t$ (c) $\sin 2t$

3. (15 pts) If $\csc x = 2$ and $\frac{\pi}{2} \leq x \leq \pi$, find:

(a) $\cos x$
 (b) $\sin\left(x + \frac{\pi}{3}\right)$

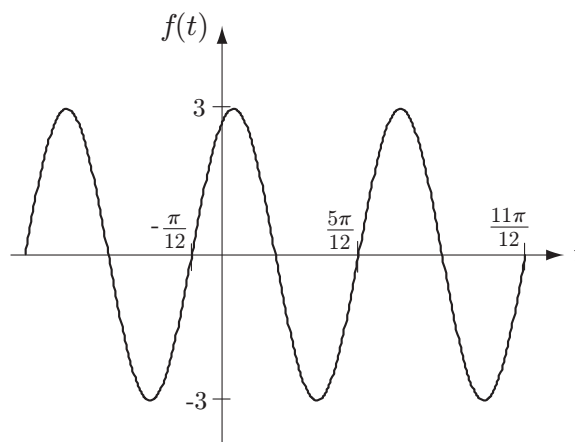
4. (15 pts) Prove the following identity:

$$\cos 3x = 4 \cos^3 x - 3 \cos x$$

5. (15 pts) Compute the **EXACT** value of:

$$\sin\left(\cos^{-1}\left(-\frac{1}{4}\right)\right)$$

6. (15 pts) Consider the graph of a function $f(t)$ below.



- (a) Determine values of A , b , and c such that $f(t) = A \sin(bt + c)$.
 (b) Find the period, amplitude, and phase shift of $f(t)$.