1. (10 pts.) Find the exact value (for example $\frac{1}{2}$, $\frac{\sqrt{7}}{10}$, not 0.571) of the following trigonometric expressions:

(a) $\tan\left(\frac{3\pi}{4}\right)$
(b) $\cos\left(\frac{\pi}{6}\right)$
(c) $\sec(6\pi)$.

2. (20 pts.) Which of the following statements are identities? In each case answer yes or no. If your answer is no, find a specific $x$ for which the statement is false.

(a) $\tan(x + \pi) = \tan(x)$
(b) $\sin^2(x) + \csc^2(x) = 1$.
(c) $\sin(\pi + x) = \sin(x)$.
(d) $1 + \tan^2(x) = \sec^2(x)$.

3. (20 pts.) The following figure is part of the graph of the periodic function $f(t) = A \sin(bt + c)$. Find the (a) period, (b) amplitude, and (c) phase shift of $f(t)$ and determine the function $f(t)$.

Over for Problems 4–7.
4. (10 pts.) Given that $(-5, 3)$ lies on the terminal side of the angle in standard position whose radian measure is $t$, find the **exact value** of

$$(a) \sin(t), \quad (b) \cos(t), \quad \text{and} \quad (c) \tan(t).$$

5. (10 pts.) Given that $\tan(t) = -\frac{9}{7}$ and $\sin(t) > 0$, find the **exact value** of

$$(a) \sin(t), \quad (b) \sec(t), \quad \text{and} \quad (c) \cot(t).$$

6. (15 pts.) The following information is given about a triangle: $a = 41 \text{ cm}$, $b = 18 \text{ cm}$, and $C = 25^\circ$. Find (a) $c$, (b) $B$, and then (c) $A$. (Recall that the labeling convention for triangles is $\triangle ABC$.)

7. (15 pts.) George is on top of a 90 foot lighthouse looking east at two boats. The lighthouse and boats lie on the same straight line. The angles of depression from the top of the lighthouse to the boats are $57^\circ$ and $21^\circ$ respectively. How far apart are the boats? [Hint: Draw a picture!]