1) If the \( \cos X = \frac{-5}{13} \), and \( \angle X \) is in QII, and \( \sin Y = \frac{3}{4} \), and \( \tan Y > 0 \), then find the value of \( \cos (X - Y) \). [Hint: Draw each triangle in its proper quadrant.]

2) Solve each of the following equations, for \( 0 \leq \theta < 2\pi \). Express each of your answers exactly.

   a) \( 2\cos^2 \theta = 1 - \sin \theta \)

   b) \( 2\sin(2\theta) = 2 \cos \theta \)
3) a) Write the equation of the following graph using the cosine function:

a) Write the equation of the following graph using the sine function:

4) If the depth of water at a boat dock varies with the tides. The depth is 5 feet at a low tide and 13 feet at a high tide. On a certain day, low tide occurs at 4 A.M. and the high tide occurs at 10 A.M.

a) If $y$ represents the depth of the water, in feet, $x$ hours after midnight, use a cosine function of the form $y = A \cos(B (x - C)) + D$ to model the water’s depth.

b) What is the depth of water, to the nearest tenth of a foot, at 5:30AM?

c) At what time, to the nearest tenth of an hour, would the depth of water first hit 12 feet?