

3. Find the maximum and minimum values of $g(x) = \cos(x) + \sqrt{3}\sin(x)$ on the interval $(-\infty, \infty)$.

4. A sewage gutter is to be constructed from a piece of sheet metal 8 feet long and 4 feet wide by folding up a 1 foot strip on each side. Suppose θ is the angle between the side and the vertical, as shown in the picture below. What should θ be in order to have a sewage gutter of maximum volume?