1. Find the critical points of the following function. Use the first derivative test to classify these points as either points where the function has a local maximum value or where it has a local minimum value.

   \( f(x) = \frac{x}{x^2 + 16} \)  
   \[ \frac{d}{dx}f(x) = \frac{16-x^2}{(x^2+16)^2} \]

   Critical Points: \( x = -4, x = 4 \)

   Applying the First Derivative Test, \( f(x) \) has a local minimum at \( x = -4 \) and a local maximum at \( x = 4 \).

2. The function \( f(x) \) is continuous and has the following properties:

   a) \( f'(-3) = 0, f'(1) = 0, f'(5) = 0 \)

   b) \( f'(x) > 0 \) if \( x < -3 \) if \( 1 < x < 5 \), and if \( x > 5 \). Also \( f'(x) < 0 \) if \( -3 < x < 1 \).

   Find the critical points for \( f(x) \). Determine for which values of \( x \) the function \( f(x) \) has a local maximum value and the values of \( x \) for which the function \( f(x) \) has a local minimum value.

   \[ \frac{d}{dx}f(x) = x^{-2/3}(4x-8) \]

   Critical Points: \( f'(0) = \text{DNE}, f'(2) = 0 \)

   \( f(x) \) has neither at \( x = 0 \)

   \( f(x) \) has a local minimum at \( x = 2 \)