1. In Exercises 1, do the following
   (a) Find \( f' \) and \( f'' \)
   (b) Find the critical points of \( f \)
   (c) Find any inflection points
   (d) Evaluate \( f \) at the critical points and the endpoints. Identify the global maxima and minima of \( f \)
   (e) Sketch \( f \). Indicate clearly where \( f \) is increasing or decreasing, and its concavity

   \( f(x) = x^3 - 3x^2 \quad (-1 \leq x \leq 3) \)

   \( f(x) = e^{-x} \sin x \quad (0 \leq x \leq 2\pi) \)

   \( f(x) = x^{2/3} + x^{1/3} \quad (1.2 \leq x \leq 3.5) \)

2. Find the exact minimum values of the function \( h(z) = \frac{1}{z} + 4z^2 \) for \( z > 0 \)

3. Find constants \( a \) and \( b \) in the function \( f(x) = a x e^{bx} \) such that \( f(\frac{1}{3}) = 1 \) and the function has a local maximum at \( x = \frac{1}{3} \).