1. For the functions below do the following:
   (i) Determine the critical points
   (ii) Determine the open intervals where the function is increasing and where it is decreasing
   (iii) Classify the critical point(s)
   (a) \( f(x) = 3x^4 + 4x^3 - 36x^2 \)

   (b) \( g(x) = x^{3/4} - x^{5/4} \)

   (c) \( h(x) = (1 - 2 \cos(x))^2 \) on \((-\pi/2, \pi/2)\)
2. For the function \( f(x) = \frac{1}{x}, x > 0 \), find the tangent line at the point \((a, 1/a)\) and its corresponding \(x\) and \(y\) intercepts. For which point \((a, 1/a)\), is the distance between the \(x\)-intercept and the \(y\)-intercept of the tangent line the smallest?