1. (40 pts.) Find the following limits:
   (a) \( \lim_{x \to 2} \frac{x - 2}{2} \)
   (b) \( \lim_{x \to 1^+} \frac{|x - 1|}{1 - x} \)
   (c) \( \lim_{x \to 0} \frac{x}{\sin 2x} \)
   (d) \( \lim_{x \to 0} x^4 \sin \left( \frac{1}{x} \right) \)

2. (40 pts.) Differentiate the following functions:
   (a) \( (x - 1)^5 \sqrt{x + 1} \)
   (b) \( \frac{x}{x^3 + 1} \)
   (c) \( \sqrt{1 - \sqrt{x}} \)
   (d) \( \cos^7 x^7 \)

3. (20 pts.)
   (a) Find equations for the two lines tangent to \( y = x^4 \) at \( x_0 = -2 \) and at \( x_0 = 2 \).
   (b) What is the point of intersection of these two tangent lines?

4. (20 pts.)
   (a) Find the critical points of the function \( f(x) = |x| \).
   (b) Find the minimum and maximum values of this function in the interval \([-1,2]\).