1. Find the absolute maximum and absolute minimum values of f on the given interval.

   (a) $f(x) = 3x^5 - 5x^3 - 1,$ $[-2, 2]$

 (b) $f(x) = x - 2\cos x,$ $[-\pi, \pi]$

   (c) $f(x) = \dfrac{x}{x^2 + 1},$ $(-\infty, \infty)$

2. In each of the following state the function in terms of only one variable along with its domain. DO NOT SOLVE THE PROBLEM.

   (a) A poster is to have an area of 180 in^2 with 1-inch margins at the top and sides and a 2-inch margin at the ~~top~~ BOTTOM. What dimensions will give the largest printed area?

   (b) A rectangle has its base on the x-axis and its upper vertices on the curve $y = \dfrac{1}{x^2 + 1}$, as shown in the figure. Find the maximum possible area of the rectangle.
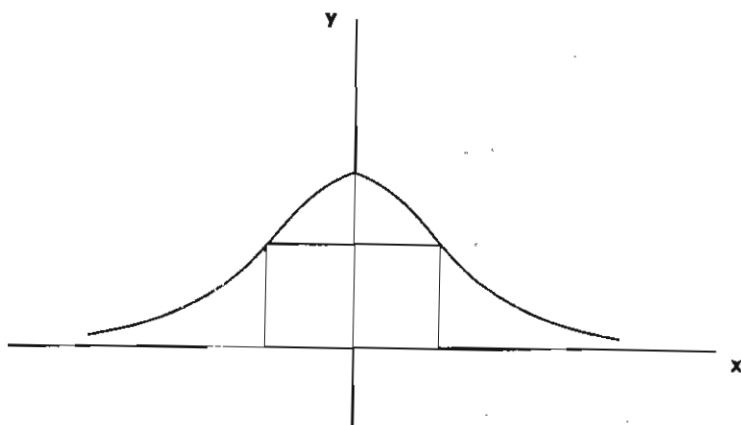
   (c) Find the point on the parabola $y = 1 - x^2$ at which the tangent line cuts from the first quadrant the triangle with the smallest area.