1. (10 pts) Find the most general antiderivative of the function. (Hint: you may check your answer by differentiation.)

(a) $f(x) = \sqrt{x}\,(1 - x)$

(b) $f(x) = \dfrac{x^2 - 2x + \sqrt{x}}{x}$

2. (10 pts) A box (containing the top) with a square base must have a volume of $16,000$ cm^3. Find the dimensions of the box that minimize the amount of material used.