1. Find $C$ so that the following are probability density functions on the specified region.

(a) $f(x) = \frac{C(x + 1)}{x^2 + 1}$ on $[0, 1]$.

(b) $f(x) = \frac{C}{(x + 1)^{3/2}}$ on $[0, \infty)$. 
2. Use the Comparison Test to show the following either converge or diverge.

(a) \[ \int_{3}^{\infty} \frac{x + 1}{\sqrt{x^3 - 1}} \, dx \]

(b) \[ \int_{0}^{4} \frac{1}{\sqrt{x} + x^5} \, dx \]

Solution and a self grading rubric will be posted by Tuesday evening.