Written homework 3

Problem 1

Do these integral converge or diverge? "Yes" or "no" is not enough; explain your answer in detail. (Partial fractions may help with some of these integrals).

(a) $\int\limits_{-\pi/2}^{0} \tan(x)dx$

(b) $\int\limits_{10}^{+\infty} \frac{1}{x^2-4}dx$

(c) $\int\limits_{-2}^{2} \frac{1}{(x-2)(x+2)}dx$

(d) $\int\limits_{0}^{+\infty} \frac{\sin x}{x^2+1}dx$

Problem 2

Compute

(a) $\int\limits_{-\infty}^{+\infty} \frac{1}{x^2+1}dx$

(b) $\int\limits_{-5}^{+5} \frac{1}{\sqrt{|x|}}dx$