Bài 1: Tính các tích phân sau:

a) $I_1 = \int_1^{+\infty} \frac{\ln x}{x^2} dx$

b) $I_2 = \int_1^{+\infty} \frac{\ln x}{x^3} dx.$

c) $I_3 = \int_0^{+\infty} e^{-\sqrt{x}} dx$

d) $I_4 = \int_2^{+\infty} \frac{dx}{x\sqrt{x^2-1}}$

e) $I_5 = \int_0^{+\infty} \frac{x.\text{arctg}x}{\sqrt{(1+x^2)^3}} dx$

f) $I_6 = \int_{\sqrt{2}}^{+\infty} \frac{xdx}{(x^2+1)^3}$

g) $I_7 = \int_1^{+\infty} \frac{x^3}{e^{x^2}} dx$

h) $I_8 = \int_0^{+\infty} x^2 e^{-x} dx$

i) $I_9 = \int_0^{+\infty} \frac{xdx}{(x+1)^3}$

j) $I_{10} = \int_1^{+\infty} \frac{\text{arctg}x}{x^2} dx$

k) $I_{11} = \int_{-\infty}^{+\infty} \frac{dx}{x^2+2x+10}$

Bài 2: Xét sự hội tụ của các tích phân sau:

a) $I_1 = \int_1^{+\infty} \sqrt{x} \ln\left(1 + \frac{1}{x^2}\right) dx$

b) $I_2 = \int_1^{+\infty} \frac{dx}{x\sqrt{x^4 + x^2 + 1}}.$

c) $I_3 = \int_1^{+\infty} \frac{\ln(1 + x^2)}{x} dx$

d) $I_4 = \int_1^{+\infty} \frac{\sqrt{x} dx}{x^2 + \sin x}$

e) $I_5 = \int_1^{+\infty} \left(1 - \cos\frac{1}{x}\right) dx$

f) $I_6 = \int_1^{+\infty} \frac{\arctan x}{x\sqrt{x}} dx$

g) $I_7 = \int_1^{+\infty} \frac{\ln(1 + x)}{x^2\sqrt{x}} dx$

Bài 1: Tính các tích phân sau:

a) $I_1 = \int_0^1 \frac{dx}{(2-x)\sqrt{1-x}}$

b) $I_2 = \int_1^2 \frac{dx}{\sqrt{x^2-1}}$

Bài 2: Xét sự hội tụ của các tích phân sau :

a) $I_1 = \int_0^1 \frac{dx}{\sqrt{\tan x}}$

b) $I_2 = \int_0^1 \frac{xdx}{\tan x - \sin x}$

c) $I_3 = \int_0^1 \frac{\sqrt{x}}{e^{\sin x} - 1} dx$

d) $I_4 = \int_0^1 \frac{e^{\sqrt{x}} - 1}{x} dx$

e) $I_5 = \int_0^1 \frac{\ln(1+\sqrt{x})}{e^{\sin x} - 1} dx$

f) $I_6 = \int_0^1 \frac{dx}{e^{\sqrt[4]{x}} - 1}$

g) $I_7 = \int_0^1 \frac{\sqrt{x}}{\ln(1+x)} dx$

h) $I_8 = \int_0^1 \frac{1 - \cos\sqrt{x}}{x\sqrt{x}} dx$

i) $I_9 = \int_0^1 \frac{\sqrt{x}}{e^{\sin 2x} - 1} dx$

j) $I_{10} = \int_0^1 \frac{\sin\sqrt{x}}{e^{\sqrt[3]{x^2}} - 1} dx$

Bài 3: Xét sự hội tụ của chuỗi số:

a) $\sum_{n=1}^{+\infty} \frac{n^n}{(n+1)^n.2^n}$

b) $\sum_{n=1}^{+\infty} \frac{3.5.7...(2n+1)}{2.5.8...(3n-1)}$

c) $\sum_{n=1}^{+\infty} \frac{3^n.n!}{n^n}$

d) $\sum_{n=1}^{+\infty} \frac{1}{2^n}\left(1+\frac{1}{n+1}\right)^{n^2}$

e) $\sum_{n=1}^{+\infty} \left(\tan\frac{1}{3n} - \sin\frac{1}{3n}\right)$

f) $\sum_{n=1}^{+\infty} \ln\left(1+\frac{1}{n\sqrt{n}}\right)$

g) $\sum_{n=1}^{+\infty} \frac{(n+1)^{n^2}}{n^{n^2}3^n}$

h) $\sum_{n=1}^{+\infty} \frac{\ln(n+1)}{n^3}$

i) $\sum_{n=1}^{+\infty} \frac{(-1)^n}{\ln(n+1)}$

j) $\sum_{n=1}^{+\infty} (-1)^n\left(\frac{1+n}{n^2}\right)$

Bài 4: Tìm miền hội tụ của chuỗi hàm:

a) $\sum_{n=1}^{+\infty} \frac{n}{n+1}\left(\frac{x}{2x+1}\right)^n$

b) $\sum_{n=1}^{+\infty} \frac{1}{n2^n}\left(\frac{x}{x+1}\right)^n$

c) $\sum_{n=1}^{+\infty} \frac{1}{2^n}\left(\frac{2x+1}{x+2}\right)^n$

d) $\sum_{n=1}^{+\infty} \frac{(-1)^n}{n(2x-3)^n}$

e) $\sum_{n=1}^{+\infty} \frac{(x-1)^{2n}}{n4^n}$

f) $\sum_{n=1}^{+\infty} \frac{(-1)^n}{2n+1}\left(\frac{1-x}{1+x}\right)^n$

g) $\sum_{n=1}^{+\infty} \frac{(x+1)^{2n}}{n4^n}$

h) $\sum_{n=1}^{+\infty} \frac{(x+1)^n}{2^n(2n+1)}$