MATH 1700 **ASSIGNMENT 3**

1. Compute

a. $\int \frac{1}{x^3+x^5} dx$ on an interval which does not contain $x = 0$

b. $\int \frac{x+1}{x^4+x^2+1} dx$

c*. $\int \frac{x^4+1}{x^3+1} dx$

2. Compute the following limits:

a. $\lim\limits_{x\to\infty} x^n e^{-x}$ $(n \in \mathbb{N}, n \geq 1)$.

b. $\lim\limits_{x\to\infty} \dfrac{7x^3 + x^2}{2x^3 - 100}$

c. $\lim\limits_{x\to\infty} \dfrac{x}{\sqrt{x^2 + 1}}$

d. $\lim\limits_{x\to 0^+} \dfrac{xe^{\frac{-1}{x}}}{\tan^2 x}$

e. $\lim\limits_{x\to\infty} \left(x - x^2 \ln \dfrac{1+x}{x}\right)$

3.Find

a.$\int_0^{\frac{\sqrt{3}}{2}} \sqrt{1 - x^2} dx$

b.$\int \dfrac{x^3}{\sqrt{9-x^2}} dx$

c**. $\int_{\frac{\pi}{3}}^{\frac{\pi}{2}} \dfrac{1}{\sin x} dx$