

UNIVERSITY OF MANITOBA

MATH 1700 D01

Assignment 3

This assignment is based on units 5 and 6.

1.

Evaluate the following integrals.

(a)  $\int \frac{1}{x^4\sqrt{x^2-3}} dx$

(b)  $\int \frac{1}{(4x^2+4x+5)^2} dx$

(c)  $\int \frac{5x^2+30x+43}{(x+3)^3} dx$

(d)  $\int \frac{x^2+3x+1}{(x^2+4)(x^2+1)} dx$

2.

Use l'Hôpital's rule to find the limit, if it exists.

(a)  $\lim_{x \rightarrow 0} \frac{2 \sin x - \sin 2x}{2e^x - 2 - 2x - x^2}$

(b)  $\lim_{x \rightarrow +\infty} \left(1 + \sin \frac{3}{x}\right)^x$

(c)  $\lim_{x \rightarrow 0^+} (e^x + 3x)^{1/x}$