

UNIVERSITY OF MANITOBA

MATH 1700 D01

Assignment 3

This assignment is based on units 5 and 6.

1.

Evaluate the following integrals.

(a) $\int \frac{\sqrt{x^2 - 9}}{x} dx$

(b) $\int \frac{1}{\sqrt{x^2 + 8x + 25}} dx$

(c) $\int \frac{1}{4 \sin x - 3 \cos x} dx$

(d) $\int \frac{3x^3 - 18x^2 + 29x - 4}{(x + 1)(x - 2)^3} dx$

(e) $\int \frac{5x^3 - 3x^2 + 7x - 3}{(x^2 + 1)^2} dx$

2.

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

(a) $\lim_{x \rightarrow +\infty} [x - \ln(x^3 - 1)]$ *Hint: $\ln e^x = x$*

(b) $\lim_{x \rightarrow +\infty} \left(1 + \frac{1}{x}\right)^{5x}$

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