UNIVERSITY OF MANITOBA

MATH 1700 D01

Assignment 3

Due date: February 13, 2016 (Before midnight)

Total marks: 100

All assignments must be submitted ONLINE, in ONE single pdf file following the procedure explained on UM Learn. If you have trouble submitting them the right way, please contact the DE technical support.
Your assignment will not be graded if you fail to submit it ONLINE, in ONE single pdf file.

This assignment is based on units 5 and 6. SHOW ALL WORK to get full marks. Leave answers as exact answers. For example, leave it as $1/7$ **as opposed to** 0.142857**.**

1.
Evaluate the following integrals.

(a) (18 points) $\displaystyle\int \frac{\sqrt{x^2-25}}{x}\,dx$, for $x > 5$

(b) (18 points) $\displaystyle\int \frac{1}{(x^2+2x+2)^2}\,dx$

(c) (16 points) $\displaystyle\int \frac{x-1}{x^3+4x^2+4x}\,dx$

(d) (20 points) $\displaystyle\int \frac{3x+7}{x^4-16}\,dx$

2.
Use l'Hôpital's rule to find the limit, if it exists.

(a) (8 points) $\displaystyle\lim_{x\to 0}\left[\frac{1}{\ln(x+1)}-\frac{1}{x}\right]$

(b) (10 points) $\displaystyle\lim_{x\to 0^+}(\cos x)^{1/x}$

(c) (10 points) $\displaystyle\lim_{x\to 0^+}\left(\frac{1}{x}\right)^{x}$