

SIMON FRASER UNIVERSITY

MATH 157 D100 Midterm I  
(A)

Wednesday, October 5, 2016,  
11:30-12:15 (only 45 minutes)

PROVIDE THIS DATA AS IT AP-  
PEARS ON CANVAS!

Last Name \_\_\_\_\_

Given Name(s) \_\_\_\_\_

Student # \_\_\_\_\_

SFU email ID \_\_\_\_\_@sfu.ca

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### INSTRUCTIONS

1. Write your last name, given name(s), student number, and SFU email ID in the box above.
2. Sign your name in the box provided.
3. This exam has 4 questions on 6 pages. Please check to make sure your exam is complete.
4. This is a closed book exam.
5. Only approved calculators are permitted.
6. Ask for clarification if you cannot understand a question or there appa





1. Find  $f^{-1}(x)$  for the following  $f(x)$ . (DO NOT SIMPLIFY OR FACTOR YOUR ANSWER!)

[3] (a)

$$f(x) = (x^3 + x + 1)(x^2 + x + 1)^{2016}$$

[3] (b)

$$f(x) = \frac{\sqrt[3]{x}}{\frac{1}{x^3}}$$





2. No mark is given if you evaluate the following limits by using L'Hospital's Rule!!!

[3] (a) Evaluate the limit  $\lim_{x \rightarrow 7} \frac{x^2 - 6x + 7}{x^2 - 8x + 7}$  if it exists.

[2] (b) Evaluate the limit  $\lim_{x \rightarrow 1} \frac{4x^3 + 1}{2x^3 + 3x^2 + 4x + 3}$  if it exists.



[4] (c) Evaluate the limit  $\lim_{x \rightarrow 1} x(x^p - 1)$  **3 -24.7**

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[6] 4. Let  $f(x) = \frac{x-1}{x+2}$ .

(i) Simplify the expression  $\frac{f(x+h) - f(x)}{h}$  and show that it is  $\frac{3}{(x+h+2)(x+2)}$ :

(ii) Compute the limit  $\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$  if it exists.

(iii) When is  $f(x)$  differentiable and what is  $f'(x)$ ?

END

