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CONCORDIA UNIVERSITY
Department of Mathematics & Statistics

Course	Number	Section(s)
Mathematics	209	ALL EXCEPT EC
Examination	Date	Pages
Final	December 2012	3
Instructors	Course Examiner	
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Special Instructions

- ▷ Ruled booklets to be used.
- ▷ Only approved calculators are allowed.

MARKS

[9] 1. (a) Let $f(x) = \frac{3-x^2}{2x^3-x^2+9}$. Find the limits:

(i) $\lim_{x \rightarrow 1} f(x)$ (ii) $\lim_{x \rightarrow \infty} f(x)$

(b) Given that $\lim_{x \rightarrow -3} g(x) = 4$ and $\lim_{x \rightarrow -3} h(x) = -5$, find the limit

$$\lim_{x \rightarrow -3} \sqrt{g(x) - h(x)}.$$

(c) True or False; if $\lim_{x \rightarrow 4} k(x) = 5$, then $\lim_{x \rightarrow 3} k(x) = 4$. Explain your answer.

[13] 2. (a) If $g(x) = -3x^4 + 2x^2 - \pi$, find $g'(x)$.

(b) If $f(x) = (\ln(x) + x)(2x^2 - 5)$, find $f'(x)$.

(c) If $y = \frac{(e^x - x)}{(x^2 - 2x)}$, find y' .

(d) If $y = \sqrt[3]{x^5 - 7}$, find $y' = ?$

(e) Find y' if $e^y = y^3 - 2x$.