CONCORDIA UNIVERSITY
Department of Mathematics & Statistics

Course	Number		Section(s)
Mathematics	206/4		All
Examination	**Date**	**Time**	**Pages**
Alternate Midterm	March 2011	1 Hour 30 minutes	2
Instructors			**Course Examiner**
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Special Instructions

▷ **Only approved calculators are allowed.**

MARKS

[4] **1.** Simplify the expressions below. Do not use a calculator.

(a) $(256^{\frac{1}{4}}\sqrt{5})^2$ (b) $2\sqrt{20} - 3\sqrt{45}$

[4] **2.** Rationalize the denominator:

(a) $\dfrac{5}{3\sqrt{5}}$ (b) $\dfrac{2-\sqrt{5}}{2+\sqrt{5}}$

[6] **3.** Simplify the expressions:

(a) $(x^6 + 16x^3 + 64) + 3x(x^4 - 5x^3 + 4x^2)$ (b) $\dfrac{3x}{x-4} + \dfrac{2x}{x+3}$

[8] **4.** Factor the polynomials completely:

(a) $3x^2 - 12x - 15$ (b) $3 - 27x^2$

[3] **5.** Use synthetic division to determine whether $x+1$ is a factor of $x^4 - x^3 + x^2 - x + 1$.

[6] **6.** Solve the equations:

(a) $3x^2 - 10x - 8 = 0$ (b) $x(x-8) = -12$ (c) $4(x-1) = 3x - 2$

PLEASE TURN OVER

[6] **7.** Solve the inequalities, express your answer using set notation or interval notation:

(a) $8 - 4(2 - x) \leq -2x$ (b) $|-x-2| \geq 1$

[4] **8.** (a) Write an equation for a line passing through $(-1, 1)$ and slope -2.

(b) Write the equation of a circle with center at $(-10, -20)$ and radius 2.

[4] **9.** Find the domain of the functions (do not graph):

(a) $f(x) = \sqrt{\dfrac{2}{x-1}}$ (b) $g(x) = \sqrt{3x - 12}$

[5] **10.** Sketch the graph of the function $f(x) = 3 - x^2$, starting from the graph of the function $g(x) = x^2$.