

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

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

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

- [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) $f(x) = \sqrt{\frac{2}{x-1}}$ (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 $g(x) = x^2$.