

Concordia University  
Department of Mathematics & Statistics

Course	Number	Section(s)
MATH	202	ALL
Examination	Date	Pages
Midterm	October 2017	1
Instructors	Course Examiner	
ALL	Dr. Cohen	

Special Instructions

- Answer all questions.
- Only approved calculators are allowed.

(4 points) 1. Use the remainder theorem and synthetic division to show that

$$\frac{1}{4} \text{ and } \frac{3}{2} \text{ are zeros of } f(x) = 8x^4 - 30x^3 + 23x^2 + 8x - 3$$

(3 points) 2. Factor  $f(x) = 8x^4 - 30x^3 + 23x^2 + 8x - 3$  completely.

(3 points) 3. Discuss and draw the graph of  $f(x) = 3x(x+1)^2(x-1)^2$

(3 points) 4. Discuss and draw the graph of

$$f(x) = \frac{x}{1-x^2}$$

(3 points) 5. Rewrite in the trigonometric form

$$z = |z| (\cos \phi + \sin \phi) \text{ the complex number } z = 2 + 2\sqrt{3}i$$

(4 points) 6. Use De Moivre's theorem to write  $\left(\frac{\sqrt{2}}{2} - \frac{\sqrt{6}i}{2}\right)^9$

in the form  $a + bi$