

Midterm Examination II

MAT104 Section F401

March 19th, 2013. 4:00PM–5:40PM

Instructions: Print your name on the exam booklet. This exam is closed-book and closed-note. You cannot use any electronic device in this exam. You are not allowed to talk to other students. Write all details explicitly. Answers without justifications and/or calculation steps may receive no score.

Part I

1. Multiply and combine like terms: $(x^2 - 2x + 7)(x - 2)$.
2. Multiply and combine like terms: $(y^3 + 4y^2 - 8)(2y - 1)$.
3. Combine and simplify, using positive exponents only:

$$\frac{2x^{-2}y}{8xy}$$

4. Combine and simplify, using positive exponents only: $(-5x^{-2}y)(-2x^{-2}y^2)$
5. Write 0.000000601 in scientific notation.
6. Write 819000000 in scientific notation.
7. Factor completely: $3y^4 - 9y$.
8. Factor completely: $9a^2x - 27a^3x^3$.

9. Combine into a single fraction:

$$\frac{x}{4-x} - \frac{4}{x^2-16}$$

10. Combine into a single fraction:

$$\frac{1}{x+2} - \frac{3x}{x^2+4x+4}$$

11. Divide and simplify your answer:

$$\frac{4x^2-4y^2}{6x^2y^2} \div \frac{3x^2+3xy}{2x^2y-2xy^2}$$

12. Divide and simplify your answer:

$$\frac{3x^2-10x-8}{6x^2+13x+6} \div \frac{2x^2-9x+10}{4x^2-4x-15}$$

13. Simplify:

$$\frac{2 - \frac{4}{x+2}}{5 - \frac{10}{x+2}}$$

14. Simplify:

$$\frac{1 - \frac{3}{x} - \frac{10}{x^2}}{1 + \frac{11}{x} + \frac{18}{x^2}}$$

Part II

15. Find the zeros of $f(t) = t^2 + 3t - 18$.