

Midterm Examination III

MAT104 Section F401

April 23th, 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.

1. Solve for x : $6 - 2x \geq 18$
2. Write an equation of the line through $(3, -4)$ and perpendicular to the line $2x - y = -3$.
3. Multiply and combine like terms: $(x^2 - 4x + 4)(x + 2)$
4. Combine and simplify, using positive exponents only: $(-3a^{-3}b^2)^{-2}(9ab)^2$
5. Write 40500000000 in scientific notation.
6. Factor completely: $8x^4 - 18x^8$
7. Solve for x . Leave your answer in radical form: $x^2 - 6x = 1$.
8. Combine into a single fraction:

$$\frac{x-2}{x+1} - \frac{3-12x}{2x^2-x-3}$$

9. Divide and simplify your answer:

$$\frac{x^2-x-2}{9x^3} \div \frac{x^2-4}{3x^6}$$

10. Simplify:

$$\frac{\frac{15}{x^2} - \frac{2}{x} - 1}{\frac{4}{x^2} - \frac{5}{x} + 4}$$

11. If $f(x) = 4x - x^2$, find the value of $f(1)$.

12. Find the vertex of the parabola $y = 8x + x^2$

13. Solve for x . Leave your answer in radical form: $x^2 - x + 1 = 0$.

14. Find the axis of symmetry of the parabola $y = x^2 + 3x$.

15. Find the vertex of the parabola $y = x^2 + x + 1$.