Review Test for Final Exam

MAT104 Section F401

May 2, 2013

Instructions: Take this review test having 2 hours of time, without using books, notes and calculators. Ask questions if any of these problems are not clear to you.

1. Solve for y: $y + 3 \geq 4y + 6$

2. Write an equation of the line through $(1, 2)$ and perpendicular to the line $3x + 2y = 1$.

3. Multiply and combine like terms: $(x^2 - x + 1)(x + 1)$

4. Combine and simplify, using positive exponents only: $(-2x^{-2}y^3)^{-3}(4xy)^3$

5. Write 0.000000108 in scientific notation.

6. Factor completely: $27x^6 - 12x^8$

7. Solve for x. Leave your answer in radical form: $x^2 + 8x = 3$.

8. Combine into a single fraction:
$$\frac{x^2 + 6x}{x^2 + 3x - 18} - \frac{2x - 1}{x + 6} - \frac{x - 2}{3 - x}$$

9. Divide and simplify your answer:
$$\frac{x^2 - 8x + 15}{x^2 + 2x - 35} \div \frac{15 - 2x - x^2}{x^2 + 9x + 14}$$

10. Simplify:
$$\frac{\frac{1}{y^2} - \frac{1}{xy} - \frac{2}{x^2}}{\frac{1}{y^2} - \frac{3}{xy} + \frac{2}{x^2}}$$

11. Solve for x: $216^{3x} = 36^{2x+1}$

12. If $f(x) = 5x - x^3$, find the value of $f(-1)$.

13. Find the vertex of the parabola $y = x^2 + 10x + 1$

14. If one looks at a tower with an angle $45°$ from the horizon, and 1.5 miles away from the tower, one's sight is directly reaching at the apex of the tower. If one can igonre one's height, what is the height of the tower? ($\sin 45° = \frac{\sqrt{2}}{2}$, $\cos 45° = \frac{\sqrt{2}}{2}$, $\tan 45° = 1$)

15. Simplify
$$\frac{\log_9 27}{\ln e^5}.$$