Sample Final Exam Intermediate Algebra 2 — Spring 2009

Name _____ **/200**

Problems 20 and 26 are each worth 8 points. All other Problems are worth 6 points each.

Simplify the expressions below by either evaluating as a number (in standard form, if complex), reducing to lowest terms if a rational expression, reducing radicals to simplest radical form, and using only positive rational exponents on variables.

1. $(-27)^{-\frac{2}{3}}$ = _____

2. $(5x-3)^2-(5x-3)(5x+3)$ = _____

3. $\frac{x^3+27}{x^2-9} \div \frac{2x^2-6x+18}{6x^2-14x-12}$ = _____

4. $\frac{x-2}{5x-2} - \frac{3x^2-7x-8}{15x^2-x-2}$ = _____

5. $\frac{\frac{x+1}{x-1}-\frac{x-1}{x+1}}{\frac{2}{x}+\frac{2}{x^3-x}}$ = _____

6. $\frac{(2x^{-3}y^{-2})^{-2}\cdot(\frac{1}{2}x^{-5}y^4)^{-3}}{x^6y^{-5}}$ = _____

7. $(a^{-1}-b^{-1})^{-1}$ = _____

8. $\sqrt{\frac{72}{x^3}}$ = _____

9. $\frac{1}{\sqrt[3]{-8x^9y^5}}$ = _____

10. $\frac{8}{\sqrt{6-2}} - \sqrt{96}$ = _____

11. $\frac{\sqrt{25}-\sqrt{-16}}{\sqrt{25}+\sqrt{-16}}$ = _____

12. $\log_2(16)$ = _____

13. $e^{-\ln(x)}$ = _____

Solve the following equations for x.

14. $5(2x-3)-3(3x-2)=2x-7$ x = _____

15. $\frac{1}{2x+6} - \frac{1}{x+3} = \frac{1}{2}$ x = _____

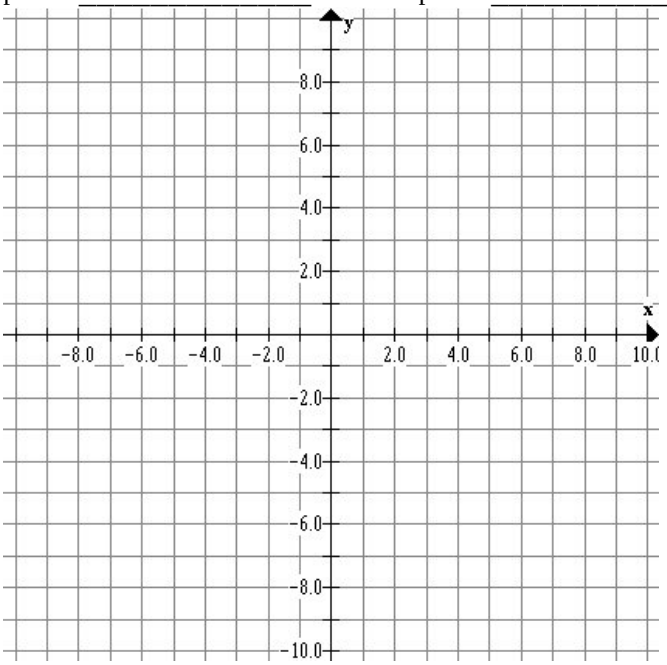
16. $2x^2 - 6x = 18$ x = _____

17. $\sqrt{x+7} - \sqrt{x} = 1$ x = _____

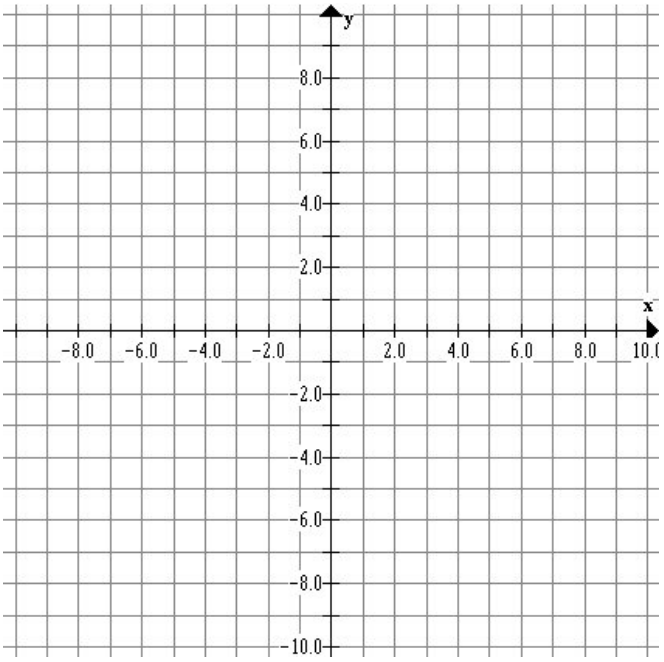
18. $\ln(5x) = -5$ $x =$ _____

19. Calculate the slope, y intercept, and x intercept of the line $8x - 4y = 12$. Graph the line below.

x intercept $=$ _____ y intercept $=$ _____ slope $=$ _____



20. Graph the function $y = f(x) = x^2 - 4x + 8$



21. Write the equation of the line in slope intercept form which passes through the points $(-3, -5)$ and $(2, 5)$.

Solve and classify (consistent and independent, inconsistent, or dependent) the following system of equations. If the solutions are dependent, give the linear "form" of the infinite number of solutions.

22.
$$\begin{array}{rcrcrcr} x & + & y & - & z & = & -3 \\ 2x & + & y & + & z & = & 4 \\ 4x & + & 4y & + & z & = & 3 \end{array}$$

23. Solve by Cramer's Rule.
$$\begin{array}{rcrcr} 8x & - & 2y & = & -14 \\ 4x & + & 5y & = & 11 \end{array}$$

24. Given $f(x) = 4x - 3$

a) What is the domain of f ?

b) What is the range of f ?

c) $f^{-1}(x)$ = _____

d) $f\left(f^{-1}(x)\right)$ = _____

25. A storage tank has two inlet pipes. The smaller inlet takes 6 minutes longer by itself to fill the tank than does the larger inlet. When both inlets are open the tank fills in 4 minutes. How long does it take the large inlet acting alone to fill the tank?