Math 100–College Algebra Exam 1
Monday June 20,2005

Name:

Instructor:

Show All necessary work and simplify all answers completely!

1. (5 pts) Express in interval notation: $\{x \mid -3 \leq x < 10\}$

2. (5 pts) Simplify: $(\frac{25x^{12}y^9z^{-4}}{5x^8y^3z^{-5}})^3$

3. (5 pts) Multiply: $(5x + 2y + 3)(3x + 4y - 1)$

4. (5 pts) Factor by grouping: $x^5 + 4x^3 + 6x^2 + 24$

5. (5 pts) Add: $\frac{5}{x-3} + \frac{7}{x^2-9}$

6. (5 pts) Simplify: $\sqrt[4]{\frac{16x^4}{81y^{12}}}$

7. (15 pts) The two points $(2, 1), (10, 7)$ are endpoints of a diameter of a circle.

   (a) Find the midpoints of the two points.This is the center of the circle.

   (b) Find the distanc between the point $(2, 1)$ and the center found in part (a).This is radius of the circle.

   (c) Use the center found in part (a) and radius found in part (b) to write down an equation of the circle.

8. (5 pts) Is this the graph of a function? Why or Why not?

9. (5 pts) Find the domain of the function:$f(x) = \frac{2}{3x^2+14x-5}$

10. (5 pts) Find the slope of the line through the points $(5, -6), (3, -4)$

11. (10 pts) Write an equation of line passing through the point (4,-3) and

    (a) Parallel to the line $y = x + 1$

    (b) Perpendicular to the line $y = x + 1$

12. (5 pts) Graph the function :$f(x) = \begin{cases} \frac{1}{3}x, & \text{if} x \leq 0 \\ x + 5, & \text{if} x > 0 \end{cases}$

13. (10 pts) Given $f(x) = x^2 + 3, g(x) = 2x - 5$,find:

    (a) $(f + g)(2)$

    (b) $(\frac{f}{g})(3)$

14. (10 pts) Suppose the graph of $f(x)$ is given as follows:

Graph the following:

(a) $g(x) = 2f(x)$

(b) $h(x) = f(x-2)$

15. (5 pts) Is the the following funtion odd,even or neither? **Why**?

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