Math 125
Exam #1
Fall 2010

Name:

1. 10 pts. Find the distance between the points $P_1 = (2, -3)$ and $P_2 = (10, 3)$.

2. 10 pts. Find the intercepts for $9x^2 + 4y = 36$, and test for symmetry.

3. 10 pts. Solve algebraically: $\dfrac{1}{x+1} - \dfrac{5}{x-4} = \dfrac{21}{4}$.

4. 10 pts. Find the equation of the line containing the points $(2, -5)$ and $(-6, -8)$, and write the equation in slope-intercept form.

5. 10 pts. Write the equation of the circle with endpoints of a diameter at $(1, 4)$ and $(-3, 2)$.

6. 10 pts. Given that $f(x) = \dfrac{x}{x^2 + 1}$, find $f(-1)$ and $f(x+1)$.

7. 10 pts. each Find the domain of each function.

(a) $f(x) = \dfrac{3x}{x^2 - 36}$.

(b) $g(x) = \sqrt{3x - 12}$

(c) $f + g$, where f & g are as in 7a & 7b.

(d) $\dfrac{f}{g}$, where f & g are as in 7a & 7b.

8. 5 pts. each Let $f(x) = 2x^2 - x - 1$.

(a) Is the point $(-1, 2)$ on the graph of f? (Substantiate your claim algebraically.)

(b) If $x = -2$, what is $f(x)$? What is the point on the graph of f?

(c) If $f(x) = -1$, what is x? What point(s) are on the graph of f?

9. 10 pts. each Let

$$f(x) = \begin{cases} |x|, & \text{if } -2 \le x < 0 \\ x^3, & \text{if } x > 0 \end{cases}$$

(a) Find the domain and range of f

(b) Graph f

10. 10 pts. Find the function that is graphed after the following transformations are applied to the graph of $y = \sqrt{x}$: (1) Shift up 3 units; (2) reflect about the x-axis; (3) shift left 5 units.

11. 10 pts. A wire of length x is bent into the shape of a circle. Express the area of the circle as a function of x.

12. 10 pts. Given that $f(x) = \sqrt{x+1}$ and $g(x) = 3x$, find $(f \circ g)(4)$ and $(g \circ f)(2)$.

13. 10 pts. each Let $f(x) = \dfrac{x-5}{x+1}$ and $g(x) = \dfrac{x+2}{x-3}$.

(a) Find $f \circ f$.

(b) Find the domain of $g \circ f$.

(c) Find the domain of $f \circ g$.