Test 2  MAT 190  Fall 2006  Name _______________________

Simplify all answers and show your work!

1. The domain of a relation tells what values ______ can be.
2. The range of a relation tells what values ______ can be.
3. What number can we not divide by? ________________.
4. What numbers can we not take the square root of in the real numbers? ________________
5. In order to add or subtract fractions, the fractions must have a common ___________________________.
6. “f(x)” is another name for __________.
7. If a function has no restrictions on its domain, what is the domain? ____________________________

8. Add: \( \frac{7}{x-2} + \frac{6}{x} \)  
9. Subtract: \( \frac{9}{x-4} - \frac{3}{x+3} \)  
10. Simplify: \( \frac{7 + 1}{2x} \)  

11. Find the domain of \( f(x) = \frac{2}{x-6} \)  
12. Find the domain of \( f(x) = \sqrt{x+2} \)

13. Given the relation \( \{(2, -5), (0, 3), (1, 1), (-3, -1)\} \), find the following:
   a) Domain: __________________  b) Range: __________________
   c) Maximum of x-values: ______  d) Minimum of x-values: ______
   e) Maximum of y-values: ______  f) Minimum of y-values: ______
   g) Make a line graph of the relation on the grid to the right.

14. How would \( f(-2) = 7 \) and \( f(0) = -5 \) be written as ordered pairs?

15. If \( f(x) = 3x - 4 \), find \( f(2x + 1) \).  
16. Given \( f(x) = 2x^2 - 3x \), find \( f(-2) \).
17. Graph $f(x) = 2x + 2$

18. Is the relation $\{(2, 3), (-2, 3), (-4, 11), (4, -11)\}$ a function or not a function? Why or why not?

19. Solve for $x$: $3(x - 5) = 4(x + 1) - 2$

Given $f(x) = 4x + 2$ and $g(x) = 2x - 3$, find the following:

20. $(f + g)(x)$
21. $(f - g)(x)$
22. $(f \cdot g)(x)$

23. $\left(\frac{f}{g}\right)(x)$
24. $f(-1)$
25. $g(4)$