

Name: \_\_\_\_\_

**Please show all work and justify your answers writing neatly and legibly.**

1. Find the domain of the expression  $\frac{2}{x-5}$ .

2. Perform the multiplication  $(2x^2 - 5)^2$ .

a.  $4x^2 - 25$

b.  $4x^4 - 25$

c.  $4x^4 - 20x^2 + 25$

d.  $4x^4 - 10x^2 - 25$

e. None of these

3. Solve for  $x$ :  $3[2x - (7x - 1)] = 5x + 13$ .

4. Find all real solutions of the equation  $3x^3 = 27x$ .

5. Find all real solutions of the equation  $2x^2 = 162$ .

6. Solve the quadratic equation by completing the square:  $6x - x^2 = 3$ .

- a.  $-3 \pm 2\sqrt{3}$       b.  $3 \pm \sqrt{6}$       c.  $3 \pm 2\sqrt{3}$   
d. 3, 9      e. None of these

7. Find all real solutions of the equation  $3x^3 - 24x^2 + 21x = 0$ .

8. Solve for  $x$ :  $\sqrt{2 - 5x} = 5x$ .

9. Solve for  $x$ :  $|2 - 4x| = 12$ .

10. Solve the following system of equations by the method of substitution:

$$\begin{aligned}x + y &= 1 \\x^2 + 3y^2 &= 21.\end{aligned}$$

11. Write the interval  $[-3, 2)$  as an inequality.

12. Solve the inequality  $3 - 2x \leq 9$ .

- a.  $(-\infty, -3]$       b.  $(-\infty, 3]$       c.  $[-3, \infty)$   
d.  $[3, \infty)$       e. None of these

13. Graph the solution of the inequality  $|3x - 1| > 9$ .

14. Solve the inequality  $(x - 1)^2 \leq 25$ .
15. Find the slope of the line passing through (6, 10) and (-1, 4).
16. Find the slope of the line  $7x - 2y = 12$ .
17. Find an equation for the line that passes through (-1, 5) and has a slope of 2.
18. Evaluate the expression  $\frac{1}{81^{-1/2}}$ .
19. Simplify the expression  $\sqrt{75x^2y^{-4}}$ .

20. Subtract, then simplify:  $\frac{2}{x-3} - \frac{1}{x+2}$ .