

**PreCalc**  
**Unit 1 (Part 1) Review**

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

**Date:** \_\_\_\_\_

**Directions:** Follow the directions for each section. Show any work on a separate sheet of paper.

**I. Write the equation of the line, given the following information.**

1. Through (0,-3) and (5,2)

2. Parallel to  $y = -2x + 5$   
through (3,2)

3. Perpendicular to  
 $2x - 3y = -5$  through  
(-1,4)

**II. Find all roots (real and imaginary) of the given polynomial equations.**

4.  $x^3 - x^2 - 9x + 9 = 0$

5.  $x^4 - 1 = 0$

6.  $x^4 + 5x^2 - 6 = 0$

7.  $16x^4 - 1 = 0$

8.  $10x^4 - 26x^3 = -12x^2$

9.  $12x^2 = 5x + 2$

**III. Simplify each expression.**

10.  $\frac{1}{n^{-2}}$

11.  $3\sqrt{7} \cdot 6\sqrt{-21}$

12.  $\frac{x^3}{x^{10}}$

13.  $(2h)^4$

14.  $\frac{3\sqrt{6}}{12\sqrt{15}}$

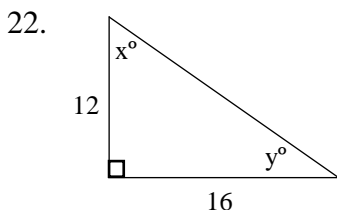
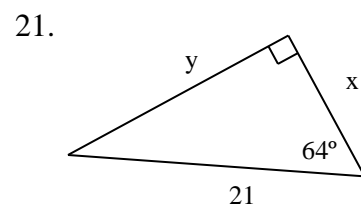
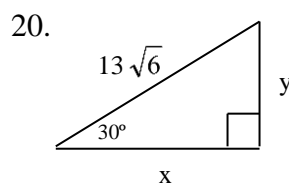
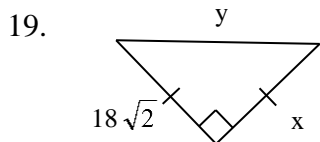
15.  $(3x^3y^{-5})^0$

16.  $\frac{8}{2-\sqrt{6}}$

17.  $(4+3i)(-2+5i)$

18.  $\frac{10x^3+19x^2+7x}{2x^3+x^2}$

**IV. Solve for all missing lengths or angle measures.**



**V. State the domain of each function. Use interval notation for your answers.**

23.  $f(x) = \sqrt{2x-4}$

24.  $f(x) = \frac{1}{x+4} + \frac{x^2}{x}$

25.  $f(x) = x^3 + 2x^2 - x - 2$

$$26. f(x) = \frac{5x+1}{x^2+5}$$

$$27. f(x) = \sqrt{x^2 - x - 42}$$

$$28. f(x) = \frac{x^2 - 9}{\sqrt{16 - x^2}}$$

$$29. f(x) = \frac{\sqrt{x+3}}{x^2 - 3x - 4}$$

$$30. f(x) = \sqrt{10 + x^2}$$

$$31. f(x) = \frac{x^3}{\frac{2}{3}x - 12}$$

**VI. Evaluate each new function given  $f(x) = x - 5$  and  $g(x) = x^2 + 6$ .**

$$32. (f + g)(x)$$

$$33. (g - f)(x)$$

$$34. (f \cdot f)(x)$$

$$35. (g/f)(x)$$

$$36. (g \cdot f)(-3)$$

$$37. (f - g)(11)$$

$$38. (g + f)(-4) + g(2)$$

$$39. (f \circ g)(x)$$

$$40. (g \circ g)(x)$$

**VII. Verify that  $f$  and  $g$  are inverses by proving  $f(g(x)) = g(f(x)) = x$ .**

$$41. f(x) = x^2 + 6, \quad g(x) = \sqrt{x - 6}$$

$$42. f(x) = \frac{1}{3}x + 3, \quad g(x) = 3x - 9$$

**VIII. Given  $f(x)$ , find  $f^{-1}(x)$ . (find the inverse of each function below)**

$$43. f(x) = 2x - 3$$

$$44. f(x) = \sqrt[3]{x+1}$$

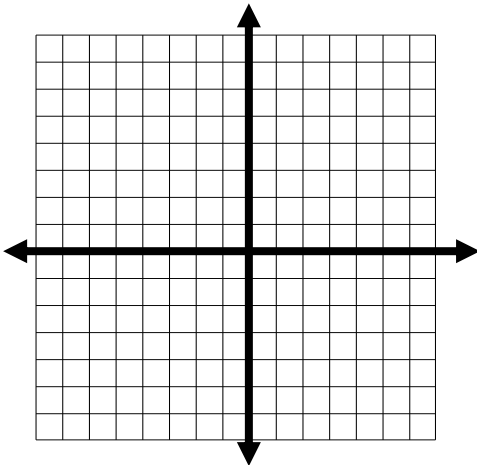
$$45. f(x) = \frac{4x - 2}{x + 3}$$

**IX. Graph each piecewise function. State the Range of each function below the graph.**

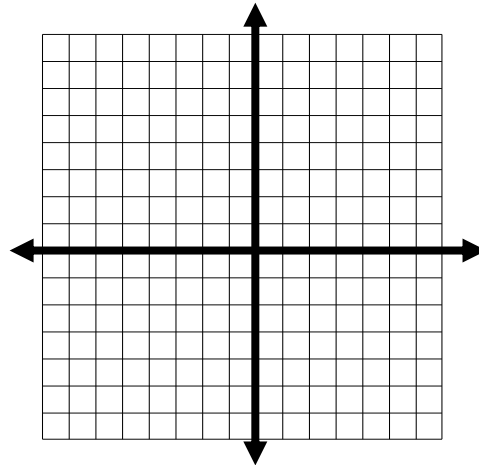
$$46. f(x) = \begin{cases} x^2 + 1 & x < 0 \\ x - 1 & x \geq 0 \end{cases}$$

$$47. f(x) = \begin{cases} -x - 2 & x \leq -1 \\ \frac{1}{2}x + 4 & x > -1 \end{cases}$$

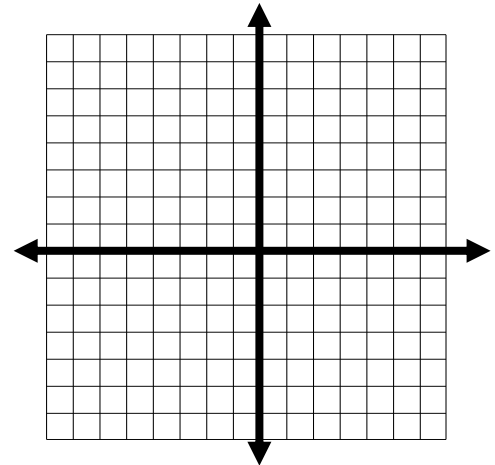
$$48. f(x) = \begin{cases} x & x \leq -3 \\ -1 & -3 < x < 1 \\ x^2 - 4x & x \geq 1 \end{cases}$$



Range: \_\_\_\_\_



Range: \_\_\_\_\_



Range: \_\_\_\_\_