ARE YOU READY FOR CALCULUS ? **Name_____**

Complete the following problems on separate paper. Show work for each problem!

1. **Completely factor: $4x^2 - 36$**

2. **If x = 3 and y = 5, and $\frac{1}{z} = \frac{1}{x} + \frac{1}{y}$, then z = ?**

3. **Simplify:** $\frac{x^{-2}y^{-6}}{3x^{-4}y^{3}}$

4. **Simplify:** $\left(x^{\frac{1}{2}}x^{\frac{3}{2}}\right)^{\frac{1}{7}}$

5. **Simplify:** $\left(\sqrt{3x} + \sqrt{5x}\right)^2$

6. **Simplify:** $3x^{\frac{-2}{3}} \bullet 4x^{\frac{1}{2}} =$

7. **Simplify:** $\sqrt[3]{24x^3y^{12}}$

8. **Simplify:** $\left(\frac{3x^2y^3}{xw^{-2}}\right)^3 =$

9. **Evaluate:** $\frac{1}{27^{\frac{-1}{3}}}$

10. **Write in exponential form:** $\sqrt[3]{7x^2y^6}$

11. **Multiply: (3x – 7)(2x + 9)**

12. **Factor: $x^2 + x - 12$**

13. **If $y = \left(\frac{1}{2}\right)^x$, find y when x = - 2.**

14. **Solve:** $(3-x)(1+x) < 0$

15. **If the two solutions of the quadratic equation $4x^2 + 4x + k = 0$ are equal, find "k" .**

16. **If the roots of a quadratic equation are -3/2 and 4/5, find one possible equation.**

17. **The equation of the line containing the points (1, 5) and (4, 3) is :**

18. **Translate the following. Do not solve. C varies jointly as d and the cube of e, and inversely as the square root of m.**

19. **Determine if (x + 2) is a factor of $x^5 + 3x^4 - 2x + 4$.**

20. **How many different real numbers satisfy the equation $6x - x^2 = 9$?**

21. If $a^{10} = 4900$, find a^5.

22. Write as a single log. log 6 + log 5 – log 3

23. Change $\log_{10} 10{,}000 = 4$ to exponential.

24. Solve for b: $\log_b 81 = 4$.

25. Simplify: $\log_2\left[\left(\sqrt[3]{x}\right)y\right]$

26. Sketch: y = 1 + log(x)

27. Solve: $\log_2(6 - 2x) - \log_2 x = 3$

28. Give the x-intercept of the graph of y = log (x – 2).

29. Sketch: $x = \sqrt{y}$

30. $\log_{49}\left(\frac{1}{7}\right) =$

31. If $|x-3| \le 4$, **what is the largest that** $|x-5|$ **could possibly be ?**

32. Find the solution set of $|x+3| < 7.$

33. Give the domain of: $f(x) = \sqrt{3-x}$

34. Give the domain of: $f(x) = \frac{3x+1}{x^2-2x}$

35. If y = f(x), describe the transformation of f(x) for y = 2 + f(-x)

36. Find the equation of any line perpendicular to y = 3x + 4.

37. The equation of a circle whose radius is 4 and whose center is (1,-3) is ?

38. The graph of x – 3y + 12 = 0 crosses the y-axis at y = ?

39. If $f(x) = x^2 - 1$ and g(x) = 2x +1, find f(g (x)).

40. Let $f(x) = 2x^{\frac{1}{3}} + 27.$ **Find $f^{-1}(x)$.**

41. Simplify: $\left(\csc^2\theta - 1\right)\tan^2\theta =$

42. T or F ? $\cos^2 x - \sin^2 x = 1$

43. If sin A = $\frac{-3}{7}$ with A in the third quadrant, find cos A.

44. Give the period of: f(x) = 4sin(3x)

45. What is the horizontal distance from the base of a tree 36ft tall if the angle of elevation is 52^o ?

46. Simplify: (sin x)(tan x)($\csc^2 x$) =

47. Which of the following functions is decreasing on its entire domain?

a) cos x **b)** $|x|$

c) $\frac{1}{x}$ **d)** $10^{\frac{x}{2}}$

48. Which of the following is false for Some real number x ?

a) $x^2 - x + 1 > 0$ **b)** $x = \sqrt{x^2}$

c) $1 = \frac{x^2+1}{x^2+1}$ **d)** $x = \sqrt[3]{x^3}$

49. Which of the following functions Has a "corner" in its graph ?

a) f(x) = $7x^2 + 5$ **b) f(x) =** $|x-2|$

c) $g(x) = \frac{x+1}{x}$ **d) h(x) =** x^3

50. Which of the following are polynomials?

a) $x + x^{-1}$ **b)** $3x^2 + \sqrt{7}x - 8$

c) $\frac{x+1}{x-1}$ **d) tan (4x)**

51. Find: $\tan(2x)$ *if* $x = \frac{\pi}{3}$

52. Find: $\cos(3x)$ *if* $x = \frac{\pi}{6}$

53. If $px^2 + qx + r = 0$**, then x = ?**

54. If the length of a rectangle is 8 more than its width, what is the area of the rectangle?

55. If x > 0, y > 0, then $\sqrt{27\sqrt{81x^8y^6}} =$

56. If p(x+ q) = qx – s and p ≠ q, then x = ?

57. Solve the system: x + 4y = 1
3x + 8y = 2

58. Two cars start moving from the same point. One travels south at 100 km/hr, the other west at 50 km/hr. How far apart are they two hours later?

59. Simplify: $\frac{6x^4y - 2xy^4}{2xy}$

60. If f(1) = 3, f(2) = 1, f(3) = 1, g(1) = 2, g(2) = 2, and g(3) = 3. Find: f(g(f(2) + 2)).