Name_____

Show all work.

Solve the following equations for y.

1) $xy + y + 1 = y$

2) $ln(y) = kt$

Factor and solve the equations.

3) $20x^2 + 13x + 2 = 0$

4) $8x^2 - 6x - 2 = 0$

Simplify each expression:

5) $\frac{(x^2)^3 x}{x^7}$

6) $\sqrt{x} * \sqrt[3]{x} * x^{\frac{1}{6}}$

7) $\frac{5(x+h)^2 - 5x^2}{h}$

8) $\frac{\frac{1}{x}+\frac{4}{x^2}}{3-\frac{1}{x}}$

Simplify by rationalizing the denominator.

9) $\frac{x}{\sqrt{x+4}-2}$

10) $\frac{h}{\sqrt{x+h}-\sqrt{x}}$

Solve each equation for x.

11) $2x^4 + 3x^3 - 2x^2 = 0$

12) $\frac{2x-7}{x+1} = \frac{2x}{x+4}$

13) $\sqrt{x^2 - 9} = x - 1$

14) $|2x - 3| = 14$

Functions

Let $f(x) = 2x + 1$ and $g(x) = 2x^2 - 1$. Find each of the following.

15) $f(2) =$ _____ 16) $g(-3) =$ _____ 17) $f(t + 1) =$ _____

18) $f[g(-2)] =$ _____ 19) $g[f(m + 2)] =$ _____ 20) $[f(x)]^2 - 2g(x) =$ _____

Let $f(x) = sin(2x)$. Find each of the following *exactly* (no calculator).

21) $f\left(\frac{\pi}{4}\right) =$ _____ 22) $f\left(\frac{2\pi}{3}\right) =$ _____

Domain and Range

Find the domain and range of each function. Write your answer in *interval notation*.

23) $f(x) = x^2 - 5$ 24) $f(x) = -\sqrt{x+3}$

25) $f(x) = 3sin(x)$ 26) $f(x) = \frac{2}{x-1}$

Equations of Lines

Write an equation for the following situations.

27) Determine the equation of a line passing through the point $(5, -3)$ with an undefined slope.

28) Determine the equation of a line passing through the point $(-4, 2)$ with a slope of 0.

29) Use point slope form to find the equation of the line passing through the point $(0, 5)$ with a slope of $\frac{2}{3}$.

30) Use point slope form to find a line passing through the point $(2, 8)$ and parallel to the line $y = \frac{5}{6}x - 1$.

31) Use point slope form to find a line perpendicular to $y = -2x + 9$ passing through $(4, 7)$.

32) Write the equation of a line in slope-intercept form passing through the points $(-3, 6)$ and $(1, 2)$.

33) Write the equation of a line in slope-intercept form with an x-intercept $(2, 0)$ and a y-intercept $(0, 3)$.

Unit Circle

34) You should have these memorized or be able to find the values **without** the use of a calculator.

a. $\sin(\pi)$ b. $\cos\left(\frac{3\pi}{2}\right)$ c. $\cos\left(\frac{\pi}{2}\right)$

d. $\cos(\pi)$ e. $\tan(\pi)$ f. $\sin\left(\frac{\pi}{2}\right)$

Exponential Functions

Solve for x.

35) $3^{3x+5} = 9^{2x+1}$ 36) $\left(\frac{1}{9}\right)^{x} = 27^{2x+4}$ 37) $\left(\frac{1}{6}\right)^{x} = 216$

38) $\log_2 x + \log_2(x-2) = 3$ 39) $e^{4x} = 3$ 40) $\log_2(5x+8) - \log_2(x-5) = 3$

Logarithms

Evaluate the following logarithms.

41) $\log_7 7$ 42) $\log_3 27$ 43) $\log_2 \frac{1}{32}$ 44) $\log_{25} 5$

45) $\log_9 1$ 46) $\ln \sqrt{e}$ 47) $\ln \frac{1}{e}$

Use the properties of logarithms to evaluate the following.

48) $\log_2 2^5$ 49) $\ln e^3$ 50) $\log_2 8^3$ 51) $\log_3 \sqrt[3]{9}$

52) $2^{\log_2 10}$ 53) $e^{\ln 8}$

Even and Odd Functions

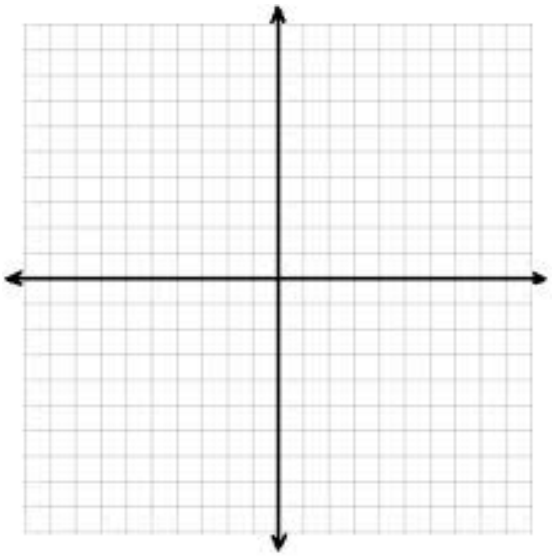
State whether the following graphs are even, odd or neither. *Show work to justify your answer.*

54) $f(x) = 2x^4 - 5x^2$ 55) $g(x) = x^5 - 3x^3 + x$

56) $h(x) = 2x^2 - 5x + 3$ 57) $j(x) = 2cos(x)$

58) Graph the piecewise function.

$$f(x)=\begin{cases} x^2+1, & 0\le x\le 2 \\ 2x+3, & 2\le x\le 4 \\ 10, & x\ge 4 \end{cases}$$



Is $f(x)$ continuous at $x=2$? Justify your answer.

Is $f(x)$ continuous at $x=4$? Justify your answer.

59. Simplify.

a. $\frac{5-x}{x^2-25}$

b. $\frac{\frac{2}{x^2}}{\frac{10}{x^5}}$

c. . $\frac{15x^2}{5\sqrt{x}}$

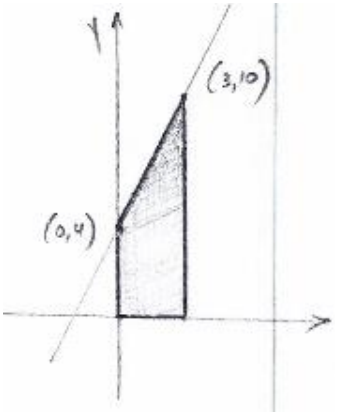
d. $(3a^3)(4a^2)$

e. $\left(4a^{\frac{5}{3}}\right)^{3/2}$

f. $\frac{\frac{1}{2}-\frac{5}{4}}{\frac{3}{8}}$

60. Find the following areas:

a.



b.