Honors Finite Math **Group Work - Unit 8** **Name**_____

NO CALCULATOR

For #1 – 2, find the *x*- and *y*-intercept(s).

1. $x^2 - 9y^2 = 9$

2. $x^2 + 4x + y^2 - 2y = 0$

3. Find the following for $f(x) = \dfrac{x^2}{x-2}$. Simplify your answers!

(a) $f(-x) =$ (b) $-f(x) =$ (c) $f(x+2) =$ (d) $f(x-2) =$

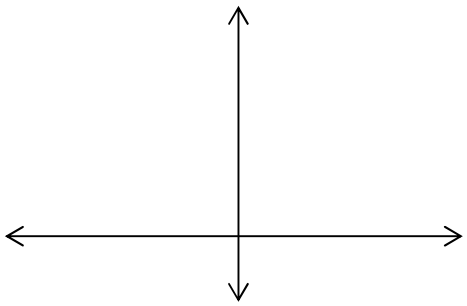
For #4 – 5, find the domain of each function.

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

5. $f(x) = \dfrac{1}{x^2 - 3x - 4}$

For #6, (a) find the domain of the function (b) locate any intercepts
(c) graph the function (d) based on the graph, find the range

6. $f(x) = \begin{cases} x^2 + 4 & \text{if } x < 0 \\ 4 - x^2 & \text{if } x \geq 0 \end{cases}$



For #7-8, write each expression as a single logarithm.

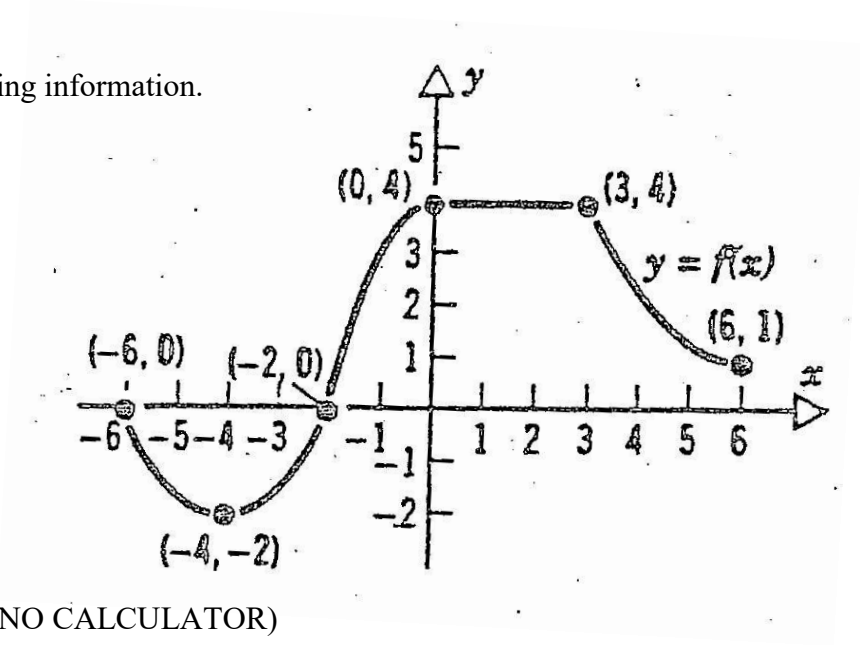
7. $\ln x + \ln\left(x^2 - 1\right) - 4\ln\left(x + 4\right)$

8. $\dfrac{1}{3}\left[2\ln\left(x+3\right) + \ln x - \ln\left(x^2 - 1\right)\right]$

For #9, use the product, quotient, and power rules of logarithms to rewrite the given logarithmic.

9. $\log_a \sqrt[3]{\dfrac{m^5 n^4}{t^2}}$

10. Use the given graph to find the following information.



(a) domain

(b) range

(c) intervals where graph:

increases

decreases

constant

(d) intercepts

Solve for x. Leave answer in exact form. (NO CALCULATOR)

11. $3^{2x+1} = 4$

12. $6e^{2x-1} - 3 = 2$

13. $\log_2(x+1) = 3$

14. $\ln 6x = \ln 2 + \ln(x-4)$

15. $100(1+0.02)^{3+x} = 150$

16. $\log_2(\log_2 x) = 1$

17. Find the difference quotient, $\dfrac{f(x+h)-f(x)}{h}$, $h \neq 0$ for $f(x) = 4x - 2x^2$