

Math 4
Exam 4
October 14, 1997

Name _____

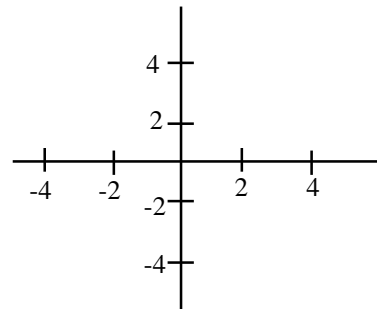
Instructor _____

Section _____

Show all necessary work for partial credit.

(12 pts) 1. Sketch the graph and label the intercepts and asymptotes. State the domain and range.

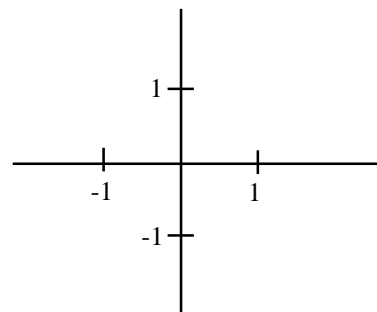
(a) $f(x) = 3^{x+2} - 4$



domain _____

range _____

(b) $g(x) = \log_2(x-1) + 1$



domain _____

range _____

(5 pts) 2. Write the expression as a sum, difference and/or multiple of logarithms.

$$\log_a \left(\frac{5\sqrt{x}y^2}{z^3} \right)$$

(4 pts) 3. Use your calculator to solve the following equation. Round your answer to 3 decimal places.

$$5^x = 8$$

(32 pts) 4. Solve the given equations and give **exact** answers. Be sure to check for reasonableness of your answers.

(a) $3\left(2^{\frac{x}{5}} + 15\right) = 57$

(b) $e^{2x} - e^x - 6 = 0$

(c) $2\ln(x-3) - \ln(x+10) = \ln(x)$

(d) $\log_2 x - \log_2(x-2) = 3$

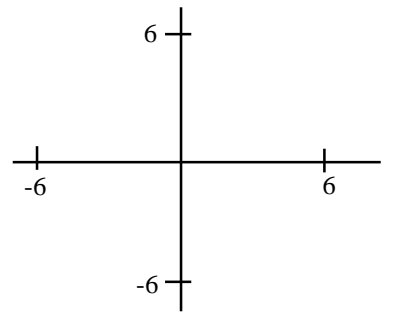
(18 pts) 5. Solve the system of equations.

$$(a) \quad \begin{aligned} x - 3y &= 15 \\ x^2 + y^2 &= 25 \end{aligned}$$

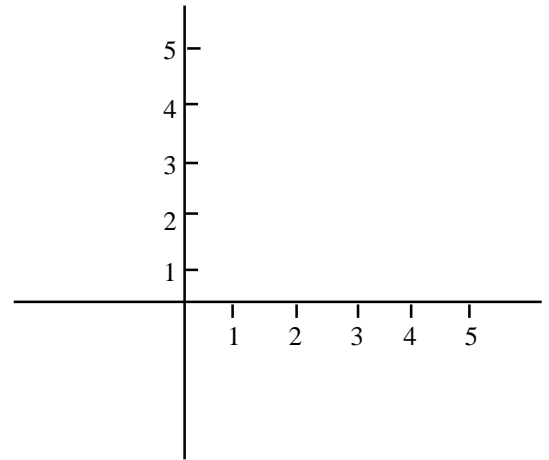
$$(b) \quad \begin{aligned} x + y + z &= 2 \\ 2y + z &= 4 \\ x - z &= -3 \end{aligned}$$

(9 pts) 6. Sketch the graph of the solution of the system of the inequalities. Label graphs. Label all points of intersection.

$$\begin{aligned} y - x^2 &> 0 \\ y &< +6 + x \end{aligned}$$



- (10 pts) 7. Derive a set of inequalities to describe the region enclosed by the triangle with vertices at $(0,0)$, $(1,2)$, and $(2,1)$.



- (10 pts) 8. Find the equation of the circle that passes through $(0,0)$, $(0,-2)$, and $(3,0)$. Use $x^2 + y^2 + Dx + Ey + F = 0$ form for your answer.
