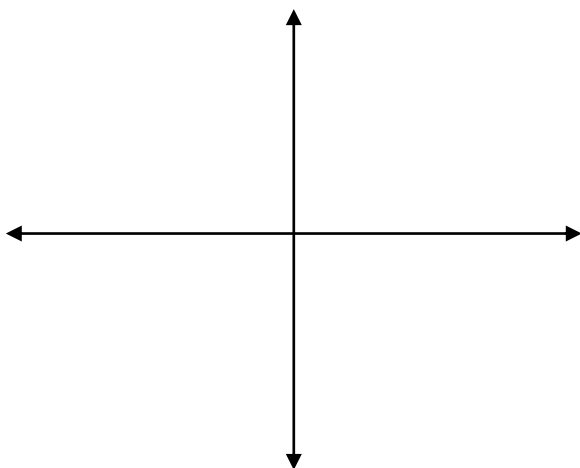


INSTRUCTIONS: You must show enough work to justify your answer on **ALL** problems. Correct answers with no work (or inconsistent work) shown **will not** receive full credit. **All answers are to be exact; no decimal approximations.** You can either print this exam and work the problems in the provided spaces or you can work each problem on your own paper. **If you do not print the exam, do not waste time by writing the problems and put a box around your answer(s) for each problem.** You are **NOT** allowed to use any books nor supplementary material. You are only allowed to use an electronic device to open and print this exam, to take pictures of the papers with your work on it, and to submit these pictures through Blackboard. **NO CALCULATORS. IF A CALCULATOR IS USED FOR A PROBLEM, YOU WILL RECEIVE A ZERO FOR THE PROBLEM. IF I SUSPECT THAT THE WORK ON A PROBLEM IS NOT YOURS, YOU WILL BE ASKED TO EXPLAIN THE WORK IN ORDER TO RECEIVE CREDIT FOR THE PROBLEM.**

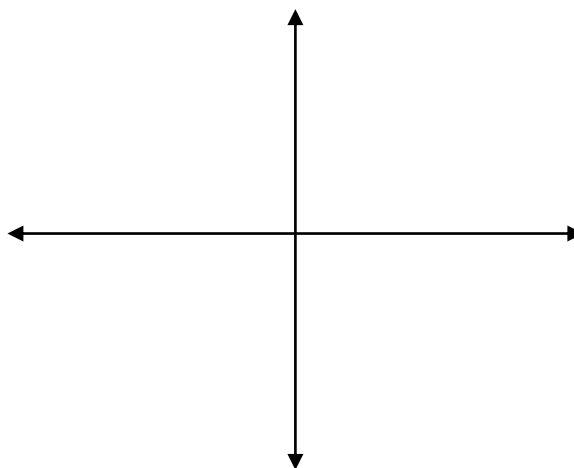
1. Sketch the graph of the following functions. Label **at most** three number(s) on the x -axis and/or y -axis to help identify your sketch. Then state the domain and range of the function in interval notation. (14 pts.)

a. $y = 3\left(\frac{5}{8}\right)^{x-2} - 6$



Domain _____ Range _____

b. $g(x) = \log(x + 4)$



Domain _____ Range _____

2. Use the properties of logarithms to write the following as a sum and/or difference of logarithms. All variables represent positive numbers. (7 pts.) **Put a box around your answer.**

$$\log_3 \frac{(2x - 5)\sqrt{x^2 + 9}}{x^3(8 - x)^6}$$

3. Write $\ln x - 4\ln(x^3 - 16) - \frac{5}{3}\ln(8x + 3)$ as a single logarithm. (6 pts.) **Put a box around your answer.**

4. Use the change of basis formula to write $\log_5 35$ in terms of base 8. (3 pts.)

Answer _____

5. Solve the following equations. **Put a box around your answer.**

a. $16^{3 - 2x} = \frac{1}{64}$ (6 pts.)

b. $8^{6x + 7} = 12$ (7 pts.)

c. $\log_2(x + 5) = 3 - \log_2(x - 2)$ (8 pts.)

Answer _____

6. A fruit grower purchased 25 apple trees and 35 peach trees for \$465. The next week the grower bought 20 apple trees and 10 peach trees for \$210. What is the cost of each tree? Set up a system of equations to solve this problem. Don't forget to identify your variables. (6 pts.) **Do NOT solve the system. Put a box around your answer.**

7. Solve the following systems of equations by the indicated method.

a.
$$\begin{aligned} 4x + 6y &= -3 \\ -5x + 4y &= -25 \end{aligned}$$
 using the addition method (6 pts.)

Answer _____

b.
$$\begin{aligned} 3x - y &= 2 \\ 2x - 5y &= 36 \end{aligned}$$
 using the substitution method (7 pts.)

Answer _____

c. $x^2 + y^2 = 9$
 $(x - 6)^2 + y^2 = 21$ using any method (substitution or addition) (9 pts.)

Answer _____

8. Determine the solution for the system represented by each augmented matrix. (10 pts.)

a.
$$\left[\begin{array}{ccc|c} 3 & -7 & 6 & 48 \\ 0 & 2 & -5 & -23 \\ 0 & 0 & 1 & 3 \end{array} \right]$$

Answer _____

b.
$$\left[\begin{array}{ccc|c} 1 & -2 & 9 & -6 \\ 0 & 1 & -5 & 11 \\ 0 & 0 & 0 & 8 \end{array} \right]$$

Answer _____

9. Solve the following system of equations using Gaussian elimination. Indicate your row operations. (11 pts.)

$$\begin{aligned} x - 8y + 3z &= 14 \\ 2x + 6y - 5z &= -27 \\ -5x - 4y + 2z &= 15 \end{aligned}$$

Answer _____