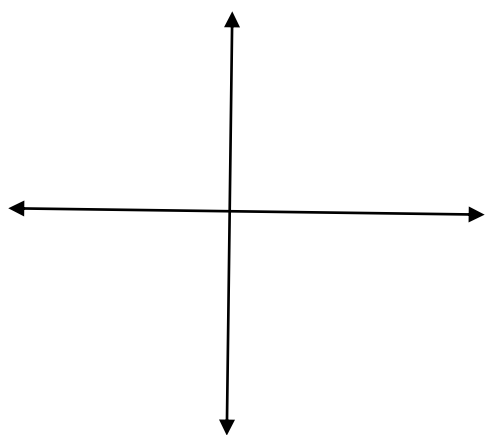


INSTRUCTIONS: You must show enough work to justify your answer on **ALL** problems. Correct answers with no work (or inconsistent work) shown **will not** receive full credit. **All answers are to be exact; no decimal approximations.** You are **NOT** allowed to use any electronic device for this exam.

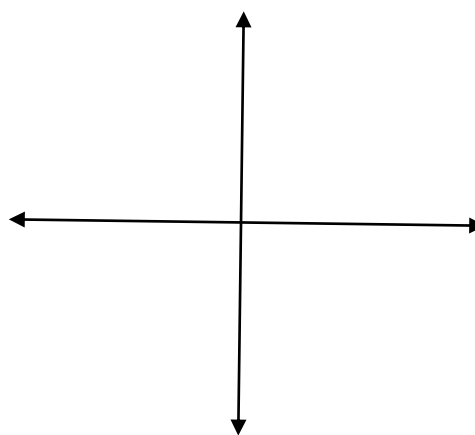
1. Sketch the graph of the following functions. Label **at most** three number(s) on the x -axis and/or y -axis to help identify your sketch. Then state the domain and range of the function in interval notation. (14 pts.)

a. $f(x) = 2\left(\frac{5}{7}\right)^x - 6$

b. $g(x) = \log_2(x + 3) + 4$



Domain _____ Range _____



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.**

$$\ln \frac{x^2(x^2 + 4)^5}{(x - 6)\sqrt[3]{5 - 3x}}$$

3. Write $\log(2x + 7) - 5\log(x^4 - 16) + \frac{3}{4}\log(x^3 + 8)$ 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.

a. $9^{6x+11} = \frac{1}{27}$ (6 pts.)

Answer _____

b. $5^{x-3} = 8$ (7 pts.)

Answer _____

c. $\log_3 x = 2 + \log_3(x+4)$ (8 pts.)

Answer _____

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

a.
$$\begin{aligned} -2x + 3y &= -8 \\ 5x + 6y &= 2 \end{aligned}$$
 using the addition method (6 pts.)

Answer _____

b.
$$\begin{aligned} 3x + 7y &= 26 \\ x + 4y &= 17 \end{aligned}$$
 using the substitution method (7 pts.)

Answer _____

c.
$$\begin{aligned} x^2 + y^2 &= 9 \\ 2x - y &= -3 \end{aligned}$$
 using the substitution method (9 pts.)

Answer _____

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

a.
$$\left[\begin{array}{ccc|c} 2 & -3 & 6 & -5 \\ 0 & 1 & 4 & 7 \\ 0 & 0 & 0 & 0 \end{array} \right]$$

b.
$$\left[\begin{array}{ccc|c} 4 & -7 & 9 & -6 \\ 0 & 1 & -8 & 12 \\ 0 & 0 & 0 & -3 \end{array} \right]$$

Answer _____

Answer _____

8. Solve the following system of equations using Gaussian elimination. Indicate your row operations. (12 pts.)

$$\begin{aligned} x - 2y + 5z &= 11 \\ 3x - 4y - 2z &= -16 \\ -2x + 5y - 6z &= -9 \end{aligned}$$

Answer _____