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1) Solve the systems:

$$(a) \begin{cases} 2x - 4y = 6 \\ 7x + 3y = 4 \end{cases}$$

$$(b) \begin{cases} \frac{3}{4}x - \frac{2}{3}y = -1 \\ -9x + 8y = 12 \end{cases}$$

$$(c) \begin{cases} x^2 + y^2 = 10 \\ 2y - x = -1 \end{cases}$$

2) Match each function with the type of model that it is.

a) $y = 2e^{\frac{x}{5}}$

i. Common Log

b) $y = \ln(x - 2)$

ii. Logistic

c) $y = 6 + \log(x + 4)$

iii. Exponential Decay

d) $7e^{-\frac{x}{4}}$

iv. Exponential Growth

e) $y = \frac{3}{1 + e^{-3x}}$

v. Natural Log

3) Find the domain, intercepts, and asymptotes of the following functions.

a) $f(x) = \ln(x + 5)$

b) $g(x) = \log_5(1 - x) + 2$

4) For each arrow describe the transformation from the function on the left to the function on the right.

Sketch a graph of the function $f(x)$ and use your transformations to graph $k(x)$.

a) $f(x) = 0.25^x \rightarrow g(x) = 0.25^{x+1} \rightarrow h(x) = -0.25^{x+1} \rightarrow k(x) = -0.25^{x+1} + 7$

b) $f(x) = \left(\frac{7}{2}\right)^x \rightarrow g(x) = \left(\frac{7}{2}\right)^{x+6} \rightarrow h(x) = \left(\frac{7}{2}\right)^{-x+6} \rightarrow k(x) = -\left(\frac{7}{2}\right)^{-x+6}$

c) $f(x) = \left(\frac{7}{2}\right)^x \rightarrow g(x) = \left(\frac{7}{2}\right)^{-x} \rightarrow h(x) = \left(\frac{7}{2}\right)^{-x+6} \rightarrow k(x) = -\left(\frac{7}{2}\right)^{-x+6}$

5) Expand and simplify the expression

a) $\log_2 \frac{\sqrt{a-2}}{32}, a > 2$

b) $\ln \left(\frac{(x^2 e^{-3})}{\sqrt{(x)(1+x)^2}} \right)$

6) Combine into a single logarithmic expression

a) $\ln 3 + \frac{1}{2} \ln x + \ln y - \frac{1}{3} \ln z$

b) $\ln 2 + \frac{1}{2} \ln(x + 1) - 2 \ln(1 + \sqrt{x})$

7) Solve the equation by using the one-to-one property

a) $4^{x+2} = \frac{1}{64}$

c) $\log(x + 4) - \log x = \log(x - 2)$

b) $e^{x^2-15} = e^{-2x}$

d) $\ln(x^2 - 2) = \ln 23$

8) Solve the following Equations:

a) $8(4^{6-2x}) + 17 = 41$

c) $\log(x + 4) - \log(x) = \log(x - 2)$

b) $e^{2x} + 9e^x - 32 = 4$

