

1. Determine if the following equalities are TRUE or FALSE: (3 pts each)

a. $\log_b \left(\frac{5}{r}\right) = \log_b r - \log_b 5$

b. $(\log_b u)^r = r \log_b(u)$

c. $\frac{\log_b a}{\log_b c} = \log_b a - \log_b c$

d. $\log_b (ab)^t = t(\log_b a) + 1$

2. Graph the piecewise function (10 pts) $f(x) = \begin{cases} -4 & x \leq -2 \\ x - 2 & -1 < x < 2 \\ -2x + 4 & x \geq 3 \end{cases}$

3. Solve the following equations. Be sure to note any extraneous solutions. (5 pts each)

a. $3^{2x} = 243$

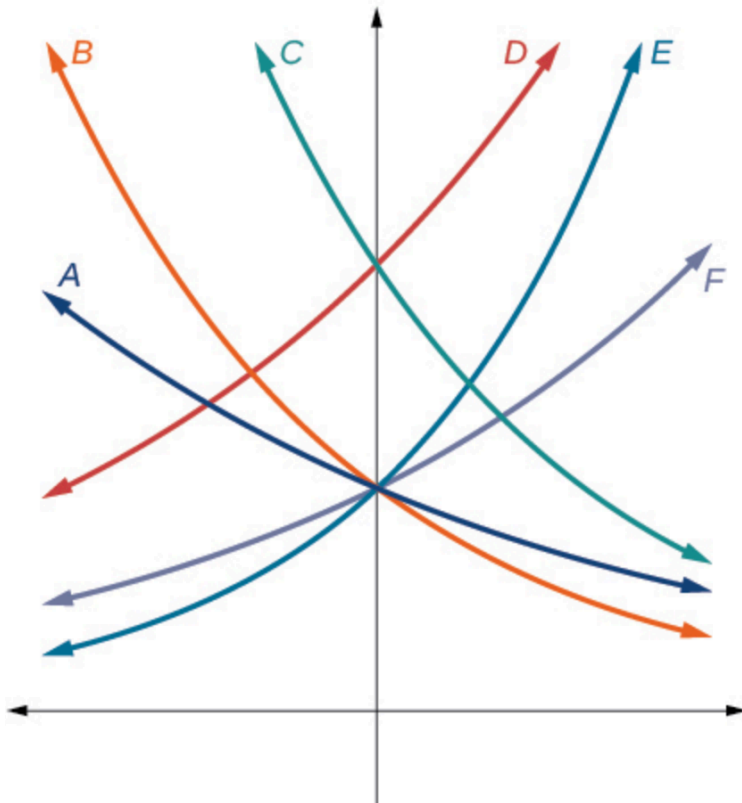
b. $8^x = \sqrt{2}$

c. $2(x^3)5^x - (8x)5^x = 0$

d. $\log_2 x + \log_2(x + 2) = 3$

e. Evaluate: $\log_b(\sqrt{x^2 + 1} - x) + \log_b(\sqrt{x^2 + 1} + x)$

4. Match each function with one of the graphs: (2 pts each)



$$f(x) = 2(0.69)^x$$

i. _____

$$f(x) = 2(1.28)^x$$

ii. _____

$$f(x) = 2(0.81)^x$$

iii. _____

$$f(x) = 4(1.28)^x$$

iv. _____

$$f(x) = 2(1.59)^x$$

v. _____

$$f(x) = 4(0.69)^x$$

vi. _____

5. Sketch the graph of the given functions. Be sure to identify any asymptotes. (6 pts each)

a. $y = \log_{\frac{1}{3}}(x - 3)$

b. $f(x) = e^{x+2} - 1$

c. $y = -\ln(-x)$

d. $f(x) = 1 - e^{-(x-1)}$

6. Consider the function $f(x) = e^{2x-3}$

a. Find the inverse of the function, $f^{-1}(x)$. (5 pts)

b. Graph both $f(x)$ and $f^{-1}(x)$ on the same coordinate plane. (5 pts)

7. Find the equation of the exponential function graphed below. Be sure to put your answer in function notation. (7 pts)

