Name: Solutions _____ _____ / 12

No aids (calculator, notes, text, etc.) are permitted. Show all work for full credit and box your final answer.

1. [6 points] State the following logarithmic properties:

1. $\log_a 1 =$ 0
2. $\log_a a =$ 1
3. $a^{\log_a x} =$ x
4. $\log_a(x \cdot y) =$ $\log_a(x) + \log_a(y)$
5. $\log_a\left(\frac{x}{y}\right) =$ $\log_a(x) - \log_a(y)$
6. $\log_a x^r =$ $r \log_a x$

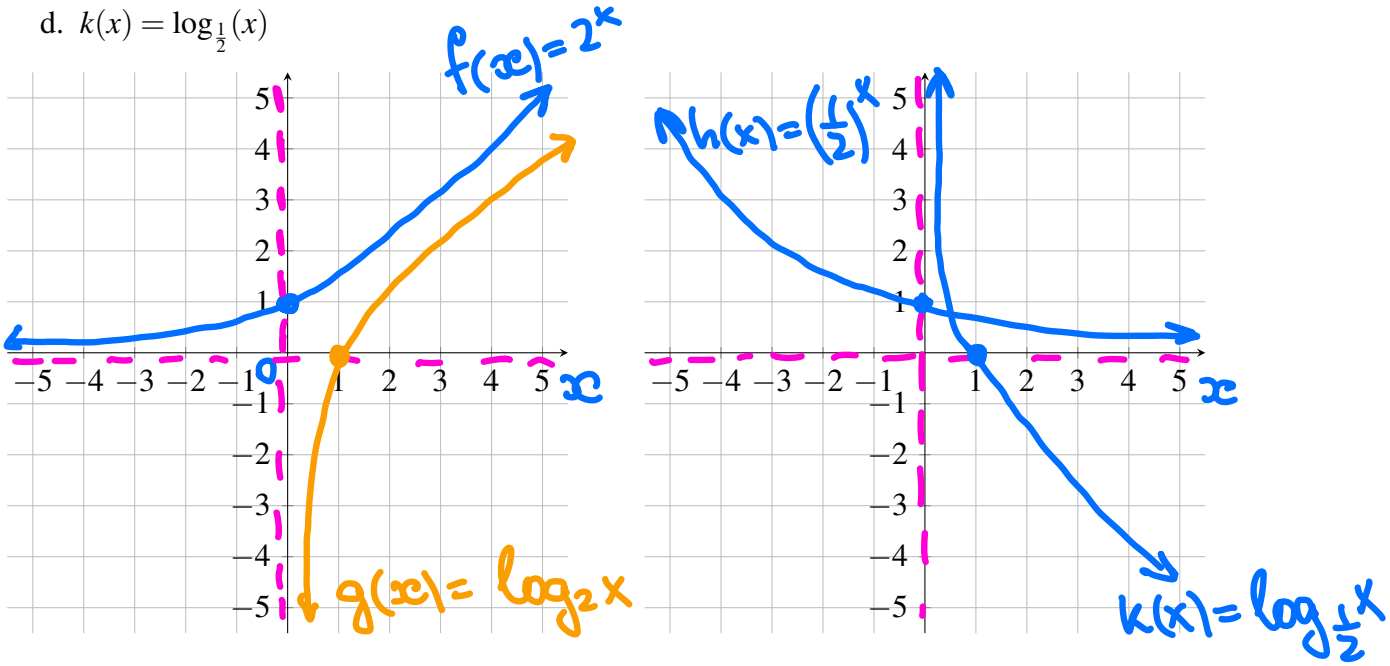
2. [4 points] Sketch the graphs of the following functions. Mark on your graphs **all asymptotes** and ***x*-,*y*-intercepts**. Name your functions on the plane.

a. $f(x) = 2^x$

b. $g(x) = \log_2(x)$

c. $h(x) = \left(\frac{1}{2}\right)^x$

d. $k(x) = \log_{\frac{1}{2}}(x)$



3. [2 points] Solve the following equation

$$\log(2x-4)=1$$

$\log_{10}(2x-4)=1$

$10^1 = 2x-4$

$10 = 2x-4$

$14 = 2x$

$\boxed{x=7}$