Name: _____   _____ / 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. $\log_a 1 =$

   2. $\log_a a =$

   3. $a^{\log_a x} =$

   4. $\log_a(x \cdot y) =$

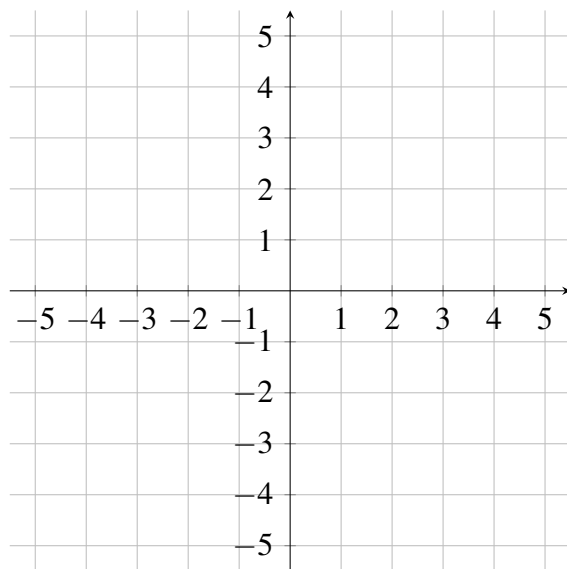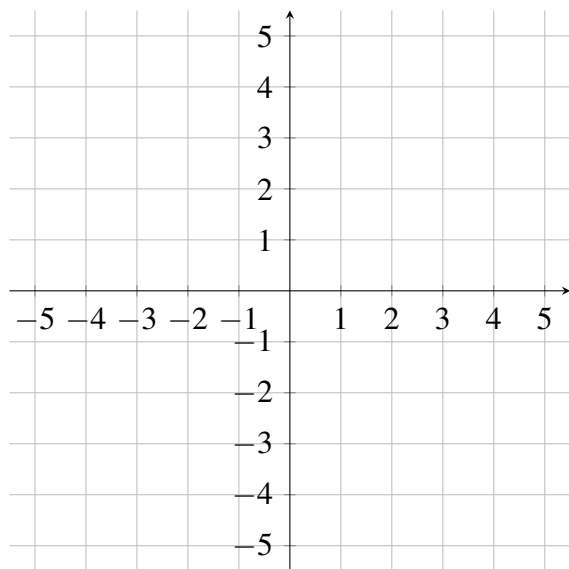   5. $\log_a \left(\dfrac{x}{y} \right) =$

   6. $\log_a x^r =$

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

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

3. [2 points] Solve the following equation

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