RIDDLE NAME _____

PRE-CALCULUS

EXPONENTIAL AND LOGARITHMIC FUNCTIONS

Graph the following functions. Discuss the domain, range, and end behavior for each.

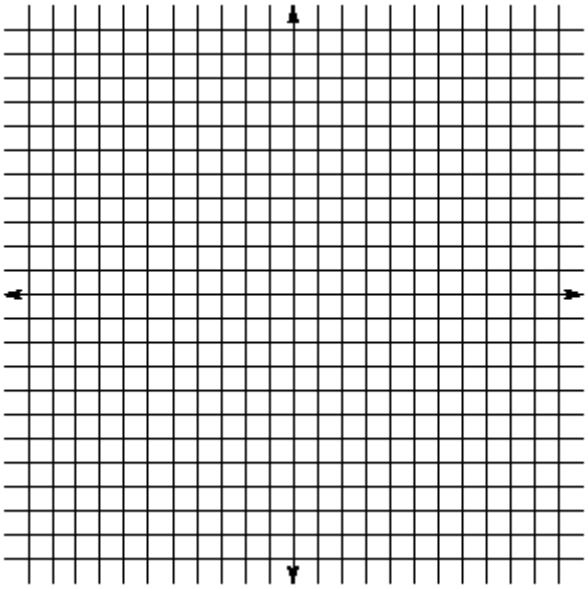
1. $y = 4^x$

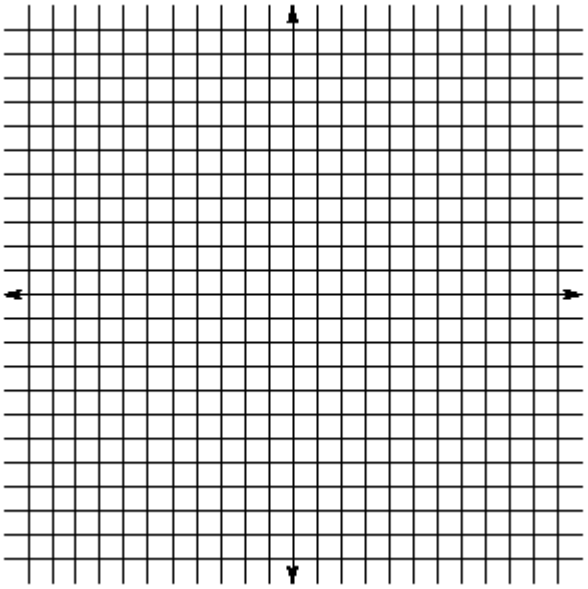
2. $y = 4^{x-2}$

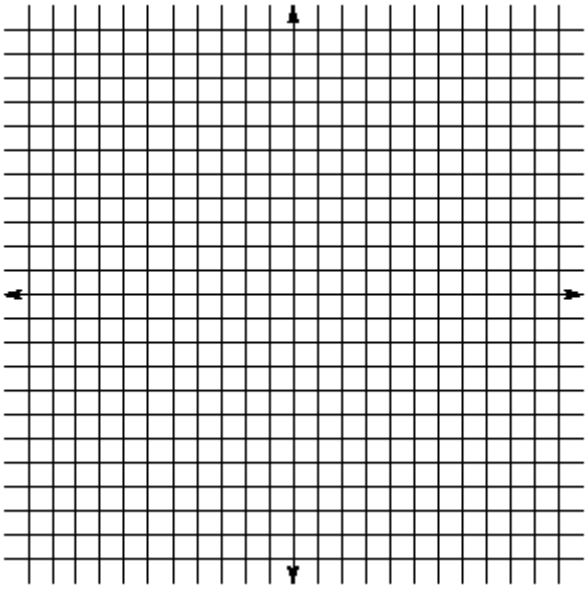
3. $y = \log_4 x$

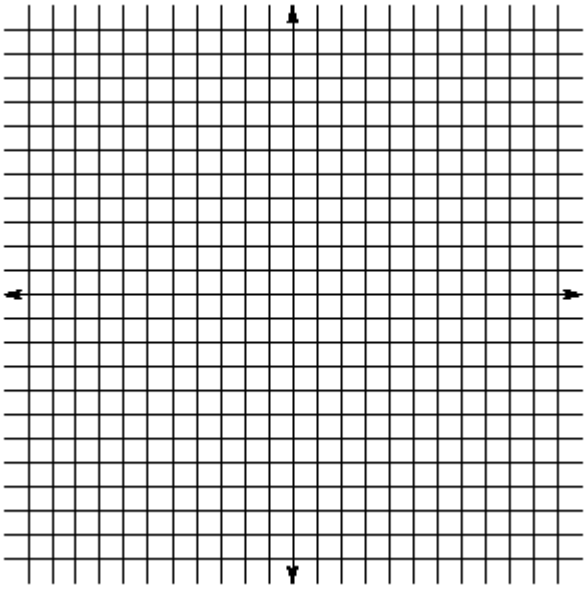
4. $y = \log_4 (x+1)$

5. $y = 4^x - 2$









SOLVE.

6. $\log_6 216 = x$

7. $\log_x 64 = 3$

8. $\log_3(4x+4) = \log_3 64$

9. $\log_9 5x = \log_9 6 + \log_9(x-2)$

10. $\log_4 12 - \log_4 x = \log_4 3$

11. $3\log_7 4 + 4\log_7 3 = \log_7 x$

12. $8^x = 10$

13. $1.8^{x-5} = 19.8$

14. $x < \log_2 15$

15. $1500 = 6e^{0.043t}$

16. $1249 = 175e^{-0.04t}$

17. $2^x = 3^{x-1}$

18. You invest $2575 in an account that pays 6.25% compounded continuously. How much money will you have after 6 years?

19. After 13 years, 2.1 pounds of radioactive material remain from a 7-pound sample. What is the half-life of this material?

20. DDT is an insecticide that has been used by farmers. It decays slowly and is sometimes absorbed by plants and animals that humans eat. DDT absorbed in the mud at the bottom of a lake is degraded into harmless products by bacterial action. Experimental data shows that 10% of the initial amount is eliminated in 5 years.

    a) Find the value of k.

    b) How much of the original DDT is left after 10 years?

    c) The US Environmental Protection Agency banned almost all use of DDT in the US in 1972. If none has been used near the lake since then, in what year will the concentration of DDT fall below 25%?