Pre-Calculus Worksheet   Name: _____

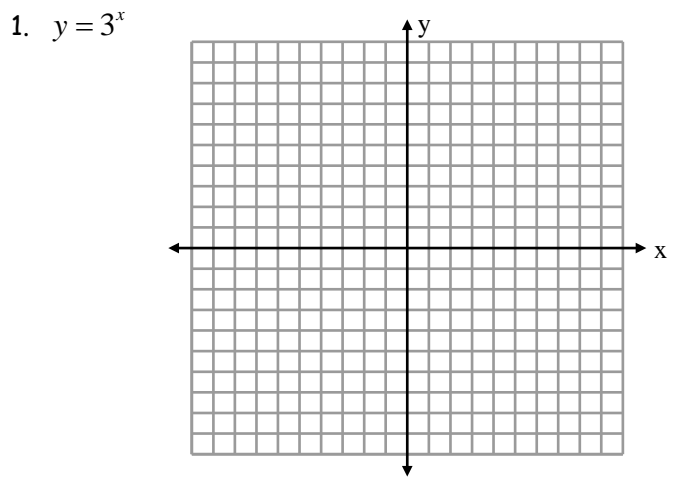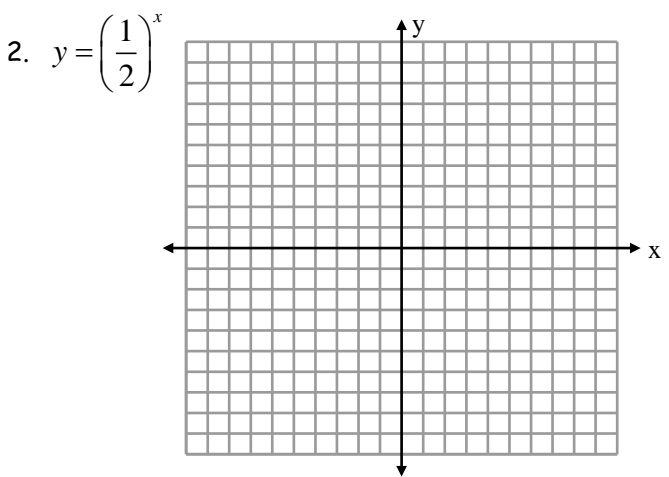Section 3.2 – Logarithmic Functions   Period: _____

I.   Graph the function in ONE COLOR. Then graph its INVERSE in a SECOND COLOR.

1. $y = 3^x$

ORIGINAL FUNCTION: _____
Domain: _____ Range: _____
X-Intercepts: _____
Y-Intercepts: _____
Increasing or Decreasing? _____
Equation of Asymptote: _____

INVERSE FUNCTION: _____
Domain: _____ Range: _____
X-Intercepts: _____
Y-Intercepts: _____
Increasing or Decreasing? _____
Equation of Asymptote: _____

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

ORIGINAL FUNCTION: _____
Domain: _____ Range: _____
X-Intercepts: _____
Y-Intercepts: _____
Increasing or Decreasing? _____
Equation of Asymptote: _____

INVERSE FUNCTION: _____
Domain: _____ Range: _____
X-Intercepts: _____
Y-Intercepts: _____
Increasing or Decreasing? _____
Equation of Asymptote: _____

II.   Rewrite each expression in logarithmic form.

3. $3^2 = 9$	4. $10^{-3} = 0.001$	5. $e^3 \approx 20$	6. $\left(\dfrac{1}{2}\right)^{-3} = 8$

III.   Rewrite each expression in exponential form.

7. $\ln 6 \approx 1.8$	8. $\log_3 81 = 4$	9. $\log 100 = 2$	10. $\log_{16} 4 = \dfrac{1}{2}$

IV.   Use the definition of logarithmic function to evaluate each logarithm. NO CALCULATOR!

11. $\log_3 9$	12. $\log_5 \dfrac{1}{125}$	13. $\log_2 \sqrt[4]{8}$	14. $\log_4 16^{1.2}$
15. $\log_2(-16)$	16. $\ln e^{4.5}$	17. $\log_{\frac{1}{4}} 256$	18. $\log 0.001$

V.   Evaluate with the calculator. Round to 3 decimal places.

19. $\log 170$	20. $\log 179000$	21. $\ln 16$	22. $\ln(e-6)$
23. $\log x = 4.5$	24. $\log x = -2.1$	25. $\ln x = \dfrac{3}{4}$	26. $\ln x = 5.1$

VI.   Use the change of base formula to evaluate to 3 decimal places. SHOW YOUR WORK.

27. $\log_3 5$	28. $\log_7 4$	29. $\log_{\frac{1}{2}} 15$	30. $\log_{20} 0.125$
31. $\log_{15} 1250$	32. $\log_{\sqrt{7}} 160$	33. $\log_{13} \sqrt[3]{52}$	34. $\log_{\sqrt{7}} \sqrt[3]{\dfrac{1}{9}}$