Algebra 2 Chapter 7

Name: Key

Date: _____ Period: _____

7.4-7.5 Review: Logarithms

Use your notes and show all your work!

SKILL 5: Evaluate Logarithms (7.4)

Evaluate without a calculator:

1. $\log_2 16$ $= 4$
2. $\log_6 1$ $= 0$
3. $\log_4 \frac{1}{16}$ $= -2$
4. $\log_{1/3} 81$ $= -4$
5. $\log_3 3$ $= 1$
6. $\log_{36} 6$ $= \frac{1}{2}$
7. $\log_{27} 1/3$ $= -\frac{1}{3}$
8. $\log 0.01$ $= -2$

SKILL 6: Inverse Properties of Logarithms (7.4)

Simplify:

9. $\log_6 6^{2x}$ $= 2x$
10. $7^{\log_7 x}$ $= x$
11. $\log 10^{-5y}$ $= -5y$
12. $\log_2 32^4$ $= 20$

$= \log_2 (2^5)^4$

$= \log_2 2^{20}$

Find the inverse of the function:

13. $y = \log_2(x+3)$ $y = 2^x - 3$

$x = \log_2(y+3)$

$2^x = y + 3$

$-3 \quad -3$

$2^x - 3 = y$

14. $y = e^{x-2}$ $y = \ln x + 2$
15. $y = 2^x + 5$ $y = \log_2(x-5)$
16. $y = 3^{x-7}$ $y = \log_3 x + 7$
17. $y = \log_5 x - 10$ $y = 5^{x+10}$
18. $y = \ln x$ $y = e^x$

SKILL 7: Use Properties of Logs and the Change of Base Formula (7.5)

Expand the expression

19. $\log_3 \frac{6x}{y}$ $\log_3 6 + \log_3 x - \log_3 y$
20. $\ln 4x^2y^5$ $\ln 4 + 2\ln x + 5\ln y$
21. $\log_2 \frac{9x}{7z^3}$ $\log_2 9 + \log_2 x - \log_2 7 - 3\log_2 z$

Condense the expression into one logarithm

22. $\log_5 24 - \log_5 6$ $\log_5 4$
23. $\log_8 6 + 2\log_8 x$ $\log_8 \frac{6}{x^2}$
24. $2(\log x - \log y) + 3\log z$ $\log \frac{x^2 z^3}{y^2}$

Use the change of base formula to evaluate. Round your answer to 3 decimal places:

25. $\log_4 12$ ≈ 1.792

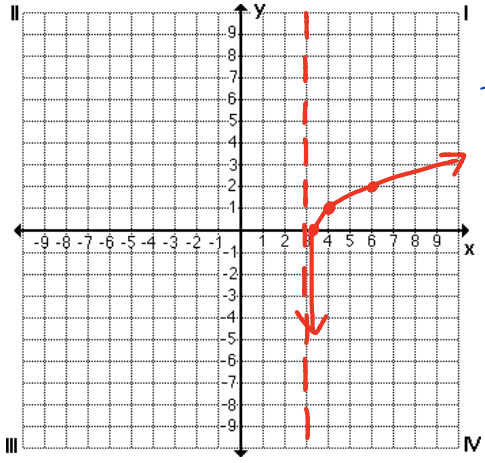
26. $\log_9 18$ ≈ 1.315

27. $\log_{20} 8$ ≈ 0.694

SKILL 8: Graph Logarithmic Functions (7.4)

Graph each function. State the domain, range, and vertical asymptote

28. $y = \log_3(x - 3) + 1$



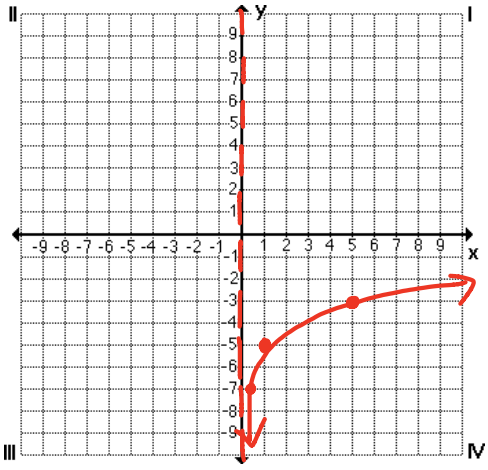
x	y
1	0
3	1
$\frac{1}{3}$	-1

Domain: $x > 3$

Range: $\mathbb{R}$

Asym: $x = 3$

29. $y = 2\log_5 x - 5$



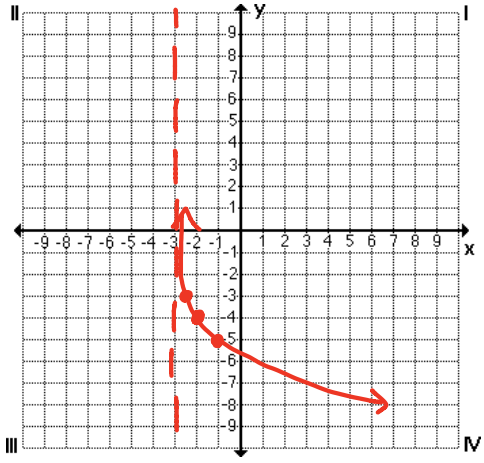
x	y
1	0
5	2
$\frac{1}{5}$	-2

Domain: $x > 0$

Range: $\mathbb{R}$

Asym: $x = 0$

30. $y = \log_{1/2}(x + 3) - 4$



x	y
1	0
$\frac{1}{2}$	1
2	-1

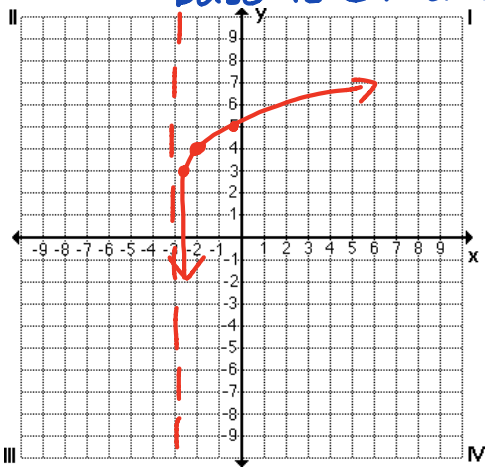
Domain: $x > -3$

Range: $\mathbb{R}$

Asym: $x = -3$

31. $y = \ln(x + 3) + 4$

↖ base is $e \approx 2.718$



x	y
1	0
$e \approx 2.7$	1
$\frac{1}{e} \approx 2.7$	-1

Domain: $x > -3$

Range: $\mathbb{R}$

Asym: $x = -3$