SM37.2 Log Evaluations

Evaluate the following expressions:

1. 3^5

243

2. 4^{-2}

$\frac{1}{16}$

3. 10^3

1000

4. -2^{-2}

$-\frac{1}{4}$

5. $\log_3 27$

3

6. $\log_4 4$

1

7. $\log_8 1$

0

8. $\log_3 \frac{1}{81}$

-4

9. $\log_5 125$

3

10. $\log_{12} 144$

2

11. $\log 1000$

3

12. $\log 0.001$

-3

13. $2^{\log_2 12}$

12

14. $\log_{11} 11^{-3}$

-3

15. $\log_4 16^x$

$2x$

16. $\log_2 \frac{1}{32}$

-5

17. $6^{\log_6(2x+1)}$

$2x + 1$

18. $\log_6 \frac{1}{216}$

-3

19. $\log_8 8^7$

7

20. $\log_{16} 4$

$\frac{1}{2}$

21. e^0

1

22. ln1

0

23. e^{lnx}

e

24. lne^2

2

Rewrite each exponential in logarithmic form.

25. $81^{1/2} = 9$ — $\log_{81} 9 = \frac{1}{2}$

26. $19^2 = 361$ — $\log_{19} 361 = 2$

27. $\frac{1}{32} = 2^{-5}$ — $\log_2 \frac{1}{32} = -5$

28. $r^8 = 117$ — $\log_r 117 = 8$

Rewrite each logarithm in exponential form.

29. $\log_{12} \frac{1}{144} = -2$ — $12^{-2} = \frac{1}{144}$

30 $\log_{15} 225 = 2$ — $15^2 = 225$

31. $\log_{11} y = x$ — $11^x = y$

32. $\log_6 1 = 0$ — $6^0 = 1$

Complete the tables of values of a function:

33) $f(x) = \log_3 x$

x	$f(x)$
$\frac{1}{9}$	-2
$\frac{1}{3}$	-1
1	0
3	1
9	2

34) $g(x) = \log_2 x$

x	$g(x)$
1	0
16	4
$\frac{1}{8}$	-3
1024	10
$\frac{1}{32}$	-5

35) $p(x) = \log_5 x$

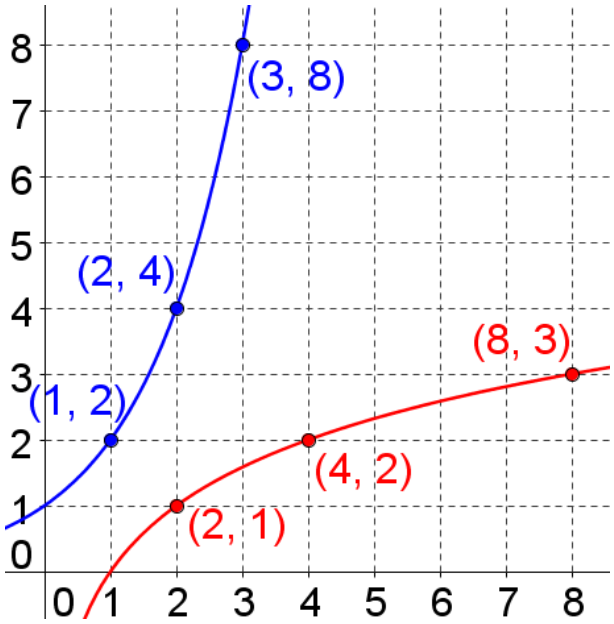
x	$p(x)$
25	2
1	0
$\frac{1}{125}$	-3
625	4
$\sqrt{5}$	$\frac{1}{2}$

36) $q(x) = \log x$

x	$q(x)$
10000	4
$\frac{1}{10}$	-1
1	0
1000000	6
$\frac{1}{1000}$	-3

37) Complete the tables then graph both functions on the same coordinate axis by plotting points and connecting with a curve.

$v(x) = 2^x$		$w(x) = \log_2 x$	
x	$v(x)$	x	$w(x)$
1	2	2	1
2	4	4	2
3	8	8	3



$v(x) = e^x$		$w(x) = ln\, x$	
x	$v(x)$	x	$w(x)$
1	2.718	e^1	1
2	7.389	e^2	2
3	20.086	e^3	3