Algebra 2 Name_____ ID: 1

Assignment

Date_____ Period____

Evaluate each expression.

1) $\log_2 4$

2) $\log_5 125$

3) $\log_4 64$

4) $\log_3 81$

5) $\log_4 16$

6) $\log_3 243$

Condense each expression to a single logarithm.

7) $2\log_8 x + 4\log_8 y$

8) $3\log_2 6 - 5\log_2 7$

9) $\frac{\log_9 x}{2} + \frac{\log_9 y}{2} + \frac{\log_9 z}{2}$

10) $9\log_6 a + 3\log_6 b$

11) $5\log_7 a - 30\log_7 b$

12) $5\log_8 u + 10\log_8 v$

Expand each logarithm.

13) $\log_4 \left(11^5 \cdot 3\right)^5$

14) $\log_8 \left(z^4\sqrt{x}\right)$

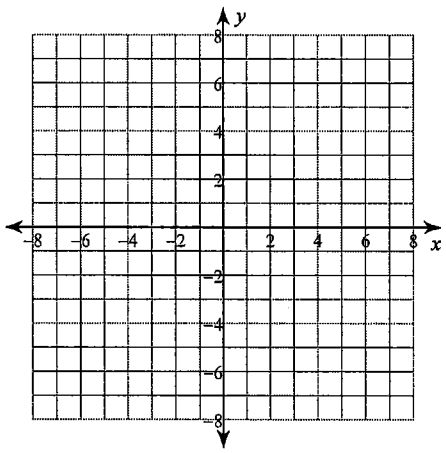
15) $\log_8 \left(3^3 \cdot 2\right)^2$

16) $\log_6 \left(u \cdot v \cdot w^5\right)$

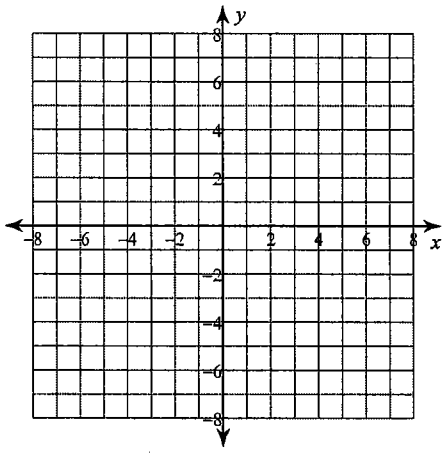
17) $\log_4 \sqrt{a \cdot b \cdot c}$

18) $\log_9 \sqrt{3 \cdot 5 \cdot 2}$

23) $y = 2\log_3(-x+4)$



24) $y = \log_3(3x+6) - 5$



Identify the domain and range of each.

25) $y = \log_4(2x-1) + 2$

26) $y = \log(3x+14) - 3$

Use a calculator to approximate each to the nearest thousandth. Use the change of base formula

27) $\log_4 67$

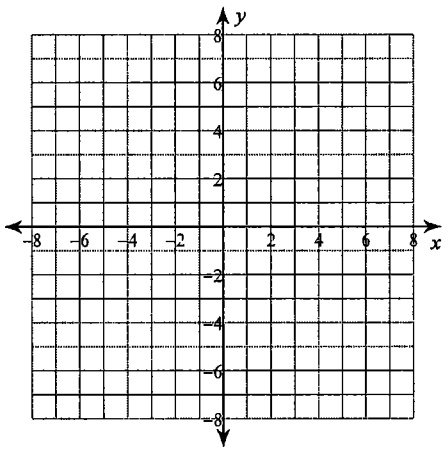
28) $\log_7 6.8$

29) $\log_2 5.52$

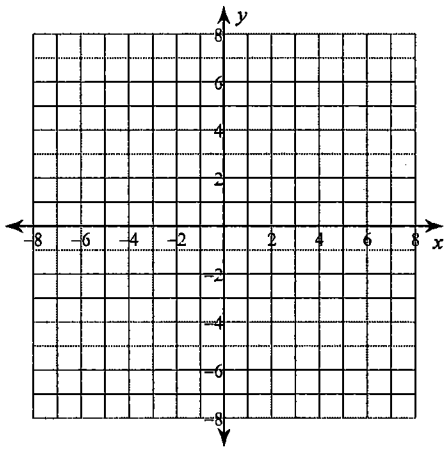
30) $\log_4 4.9$

Identify the domain and range of each. Then sketch the graph.

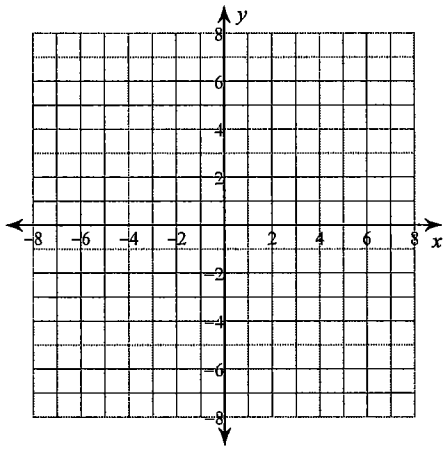
19) $y = \log_4 (x-2) - 4$



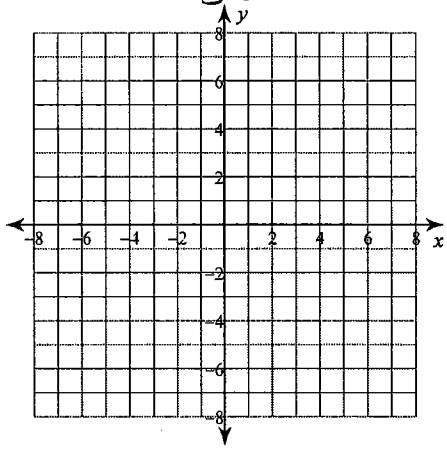
20) $y = \log_4 (x-1) - 5$



21) $y = \log_6 (3x+6) - 5$



22) $y = -2\log_3 (x+5)$



Find the inverse of each function.

31) $y = \log_2 x^2$

32) $y = \log_4 (x + 6)$

33) $y = \log_5 (-4x)$

34) $y = \log_5 (4x)$

Use the properties of logarithms and the values below to find the logarithm indicated. Do not use a calculator to evaluate the logs.

35) $\log_7 10 \approx 1.2$
$\log_7 4 \approx 0.7$
$\log_7 3 \approx 0.6$
Find $\log_7 \frac{1}{100}$

36) $\log_8 6 \approx 0.9$
$\log_8 9 \approx 1.1$
$\log_8 5 \approx 0.8$
Find $\log_8 36$

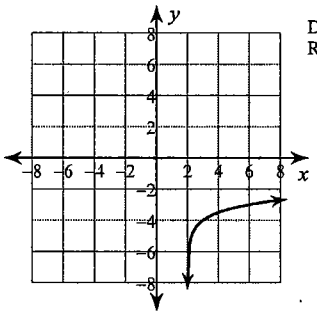
37) $\log_4 10 \approx 1.7$
$\log_4 9 \approx 1.6$
$\log_4 6 \approx 1.3$
Find $\log_4 81$

38) $\log_7 8 \approx 1.1$
$\log_7 11 \approx 1.2$
$\log_7 6 \approx 0.9$
Find $\log_7 \frac{3}{4}$

Answers to Assignment (ID: 1)

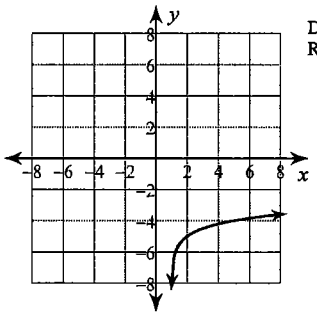
1) 2
2) 3
3) 3
4) 4
5) 2
6) 5
7) $\log_8\left(y^4x^2\right)$
8) $\log_2 \frac{6^3}{7^5}$
9) $\log_9 \sqrt{zyx}$
10) $\log_6\left(b^3a^9\right)$
11) $\log_7 \frac{a^5}{b^{30}}$
12) $\log_8\left(v^{10}u^5\right)$
13) $25\log_4 11 + 5\log_4 3$
14) $4\log_8 z + \frac{\log_8 x}{2}$
15) $6\log_8 3 + 2\log_8 2$
16) $\log_6 u + \log_6 v + 5\log_6 w$
17) $\frac{\log_4 a}{2} + \frac{\log_4 b}{2} + \frac{\log_4 c}{2}$
18) $\frac{\log_9 3}{2} + \frac{\log_9 5}{2} + \frac{\log_9 2}{2}$

19)



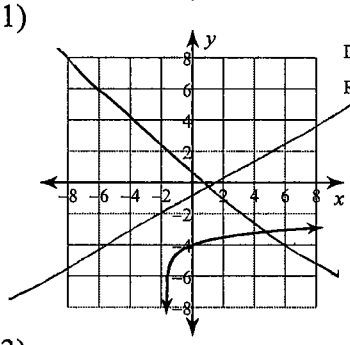
Domain: $x > 2$
Range: All reals

20)



Domain: $x > 1$
Range: All reals

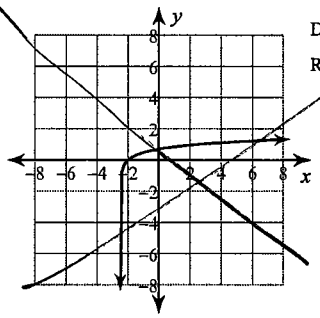
21)



Domain: $x > -\frac{5}{3}$
Range: All reals

$x > -2$

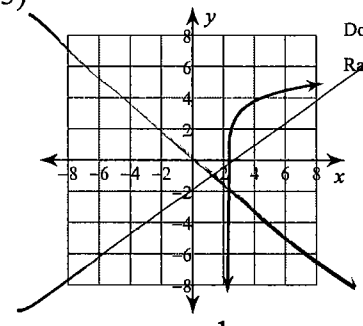
22)



Domain: $x > -\frac{5}{2}$
Range: All reals

$x \geq 5$

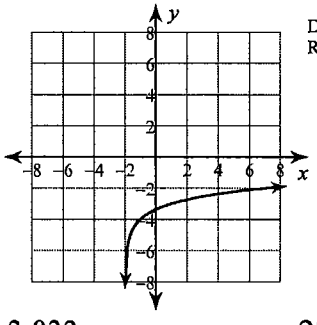
23)



Domain: $x > \frac{9}{4}$
Range: All reals

$x < 4$

24)



Domain: $x > -2$
Range: All reals

25) Domain: $x > \frac{1}{2}$
Range: All reals
26) Domain: $x > -\frac{14}{3}$
Range: All reals
27) 3.033
28) 0.985
29) 2.465
30) 1.146
31) $y = 2^{\frac{x}{2}}$
32) $y = 4^x - 6$
33) $y = -\frac{5^x}{4}$
34) $y = \frac{5^x}{4}$
35) –2.4
36) 1.8
37) 3.2
38) –0.2