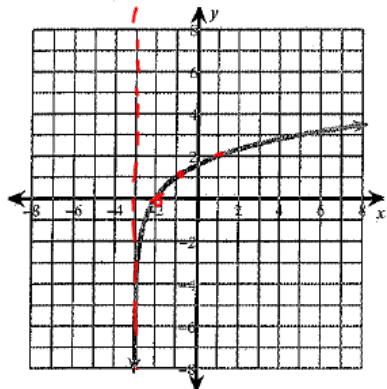
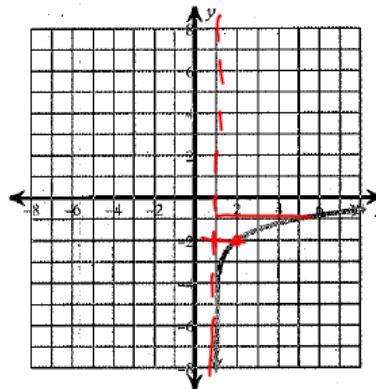


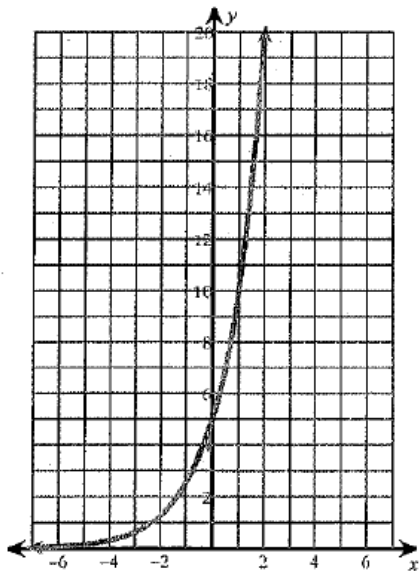
1) $y = \log_2(x + 3)$



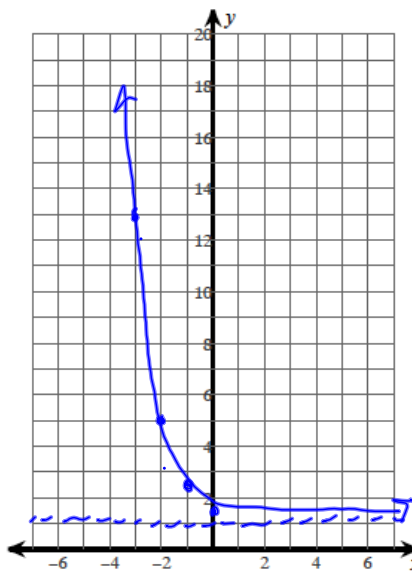
2) $y = \log_4(x - 1) - 2$



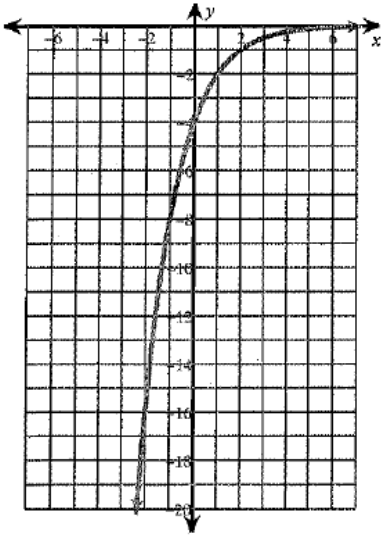
3) $y = 5 \cdot 2^x$



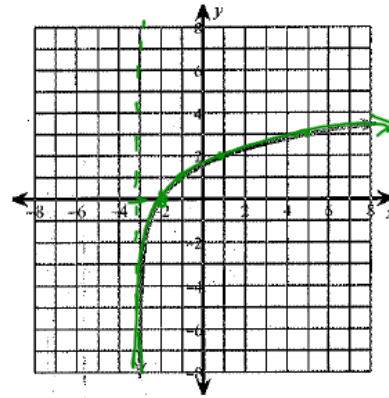
$y = 4 \left(\frac{1}{3}\right)^{x+2} + 1$



5) $y = -4 \cdot \left(\frac{1}{2}\right)^x$



6) $y = \log_2(x+3)$ *left 3*



Find the inverse of each function.

7) $y = \log_5 x - 4$

$y = 5^{x+4}$

$x = \log_5 y - 4$

$\frac{(x+4)}{5} = \log_5 y$

$5^{x+4} = y$

8) $y = 3^x + 5$

$y = \log_3(x-5)$

$x = 3^y + 5$

$x - 5 = 3^y$

$\log_3(x-5) = \log_3 3^y$

$\log_3(x-5) = y$

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

9) $\log_5 12 \approx 1.5$

$\log_5 7 \approx 1.2$

$\log_5 8 \approx 1.3$

Find $\log_5 \frac{1}{8}$

-1.3

$$\log_5 1 - \log_5 8$$

$$0 - 1.3$$

10) $\log_8 9 \approx 1.1$

$\log_8 12 \approx 1.2$

$\log_8 7 \approx 0.9$

Find $\log_8 \frac{9}{7}$

0.2

11) $\log 7 \approx 0.8$

$\log 12 \approx 1.1$

$\log 8 \approx 0.9$

Find $\log \frac{5}{32} = \log \frac{10}{64}$

-0.8

$$\log 10 - \log 64$$

$$1 - \log 8^2$$

$$1 - 2 \log 8$$

$$1 - 2(0.9)$$

$$1 - 1.8$$

12) $\log_4 6 \approx 1.3$

$\log_4 10 \approx 1.7$

$\log_4 9 \approx 1.6$

Find $\log_4 \frac{2}{27} = \log_4 \frac{4}{54}$

-1.9

$$= \log_4 \frac{4}{(9 \cdot 6)}$$

$$\log_4 4 - (\log_4 9 + \log_4 6)$$

Solve each equation.

13) $9^{10v} + 3 = 3$

No solution.

$$9^{10v} = 0$$

$$\log_9 9^{10v} = \log_9 0$$

14) $5^{x-1} + 5 = 93$

3.7819

15) $5 \cdot 3^{-6p} + 9 = 78$

-0.3982

16) $-3 \cdot 12^{7-7x} - 9 = -75$

0.8223

$$-3 \cdot 12^{7-7x} = -66$$

$$12^{7-7x} = 22$$

$$7-7x = \log_{12} 22$$

$$-7x = \log_{12} 22 - 7$$

$$x = \frac{\log_{12} 22 - 7}{-7}$$

17) $\log_9(-3n - 8) = \log_9(-4n - 9)$

No solution.

9

18) $\log_{12}(-2x - 2) = \log_{12}(x^2 - 37)$

[-7]

$$-3n - 8 = -4n - 9$$

$$n - 8 = -9$$

$$n = -1$$

19) $-2\log_3 8n = -4$

$$\left\{ \frac{9}{8} \right\}$$

20) $-\log 3a - 1 = 1$

$$\left\{ \frac{1}{300} \right\}$$

21) $\log_7 10 + \log_7 x = \log_7 22$

$$\left\{ \frac{11}{5} \right\}$$

22) $\log_7 x + \log_7 (x + 13) = \log_7 30$

$$\{2\}$$

23) $\log_6 (x - 9) + \log_6 (x - 10) = 1$

$$\{12\}$$

24) $\log_9 (2x^2 - 5) + \log_9 8 = 2$

$$\left\{ \frac{11}{4}, -\frac{11}{4} \right\}$$