

4.1

Assignment : 5

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 Class 2

25. $\sqrt[3]{x_1^3 + 8} = \sqrt[3]{x_2^3 + 8}$

$x_1 = x_2$

one to one

30. $|x-3|$

$|x-3| = x-3$

$x-3 = -x+3$

$x_1 = 6-x_2$

no.

33. $\frac{-2 + (6x-2)}{6}$

$\frac{6x-4}{6}$

$x - \frac{2}{3}$

$6\left(\frac{-2+x}{6}\right) - 2$
 $-4+x$

not inverse

36. $\frac{6}{\frac{(6-2x)}{x} + 2}$
 $\frac{6}{\frac{6}{x} - 2 + 2}$
 x

$6 - 2\left(\frac{6}{x+2}\right)$
 $\frac{6}{x+2}$

$\frac{6x+12-12}{x+2}$

$\frac{6}{x+2}$

$\frac{6x}{x+2} \div \frac{6}{x+2}$

$\frac{6x}{x+2} \times \frac{x+2}{6}$

x

inverse

42. $g(x) = \frac{8-x}{3}$

$y = \frac{8-x}{3} \rightarrow x = \frac{8-y}{3}$

$3x = 8-y$

$y = 8-3x$

$g^{-1}(x) = 8-3x$

50. $v(x) = \frac{x-5}{x+1} \rightarrow x = \frac{y-5}{y+1}$

$xy + x = y - 5$

$xy - y = -5 - x$

$y(x-1) = -5-x$

$y = \frac{-5-x}{x-1}$

70) $m(x) = \sqrt[3]{4x} + 3$
 $y = \sqrt[3]{4x} + 3$
 $x = \sqrt[3]{4y} + 3$

$y = \frac{(x-3)^3}{4}$

$m^{-1} = (x-3)^3 / 4$

4.2

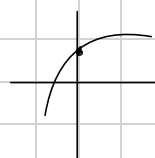
13. $f(x) = 4.2$
 $m(x) = (-4.2)^x$
 $K(x) = (\sqrt{4.2})^x$

20. $D = (-\infty, \infty)$
 $R = (0, \infty)$

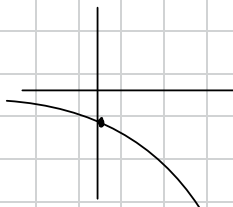
23. $D = (-\infty, \infty)$
 $R = (2, \infty)$
 $\delta = 2$ horizontal asymptote

35. $D = (-\infty, \infty)$
 $R = (-\infty, 2)$
 $\delta = 2$ horizontal asymptote

39. $D = (-\infty, \infty)$
 $R = (-\infty, 3)$
 $y = -3$ horizontal asymptote



45. $D: (-\infty, \infty)$
 $R: (-\infty, -3)$
 $y = -3$ horizontal asymptote



4.3

10) $\log_9 81 = 2 \Rightarrow 9^2 = 81$

15) $\log_c b = c \Rightarrow \log_c c^c = b$

19) $(\frac{1}{5})^{125} = 125 \Rightarrow \log(\frac{1}{5})^{125} = -3$

23. $a^2 = b \Rightarrow \log_c b = 7$

25 $\log_3 9 = \log_3 3^2$

31 $\log_2(\frac{1}{16}) = \log_2 16^{-1}$
 $= \log_2 2^{-4}$

35. $\ln e^6 = 6$

41 $\log_{1/2} = (\frac{1}{32}) = \log_{1/2} 32^{-1} = y$

$= (\frac{1}{2})^y = 32^{-1}$

$2^{-y} = 32^{-1}$

$2^y = 32$

$y = 5$

118) $v(x) = \log \frac{(x+2)}{(x-4)}$

$x+2 > 0 \quad x-4 < 0$

$x > -2 \quad x \neq 4$

$(-2, 4) \cup (4, \infty)$

68. a) As $x \rightarrow \infty$ $g(x) \rightarrow \infty$
b) As $x \rightarrow -\infty$ $g(x) \rightarrow 0$
c) As $x \rightarrow \infty$ $g'(x) \rightarrow \infty$
d) As $x \rightarrow 0^+$ $g'(x) \rightarrow -\infty$

72. $x^2 e^{-x} - e^{-x} = 0$
 $e^{-x}(x^2 - 1) = 0$
 $e^{-x} = 0 \quad x = 1 \quad x = -1$

76. $(e^x - e^{-x})^2 = e^{2x} - 2e^x e^{-x} + e^{-2x}$
 $= e^{2x} - 2 + e^{-2x}$

48. $\log_2 3\sqrt{2} = \log_2 2^{1/2} \Rightarrow \frac{1}{2}$

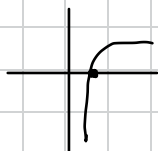
55. $\log_2 4'' = 11$

60. $4 \log_2 x (a-x) = (a-x)$

62 $\ln c^{x+1} = x^2 + 1$

64 $\log_2 1 = 0$

70. $y = \log_2 x$



80. $g(x) = \log(3-x)$
 $3-x > 0$
 $x < 3$
 $D = (-\infty, 3)$

86. $g(x) = \log_7(x^2 - 49)$
 $x^2 - 49 > 0$
 $(x-7)(x+7) > 0$
 $x > 7 \quad x < -7$
 $D: (-7, \infty)$

100 $\log_2(x-5) = 4$

a) $2 \log_2(x-5) = 2^4$
 $(x-5) = 2^4$

b) $(x-5) = 2^4$
 $x = 16+5$

c) $\log_2(21-5) = 4$
 $\log_2(16) = 4 \quad \log_2(2^4) = 4 = 4$

4.4

$$8) \log_7 = 49K = \log_7(49) + \log_7(K) \\ = 2 + \log_7 K$$

$$18) \log\left(\frac{1000}{c^2+1}\right) = \log(1000) - \log(c^2+1) \\ = 3 - \log(c^2+1)$$

$$24. \ln(0,1)^{r+1} = (r+1) \ln(0,1)$$

$$27. -1 + \log_7 m + 2 \log_7 n$$

$$35. \ln\left(\frac{\sqrt{xy}}{wz}\right) = \ln(\sqrt{xy}) - \ln(wz) \\ = \frac{1}{2} \ln(xy) - \ln(wz) = \frac{1}{2} \ln x + \frac{1}{2} \ln y - \ln w - \ln z$$

$$43. \log_2 \left[\frac{4a^2 \sqrt{3-b}}{c(b+1)^2} \right] \\ = 2 + 2 \log_2 a + \frac{1}{2} \log_2(3-b) - \log_2 c - 2 \log_2(b+1)$$

$$55 = \log_3 \left(\frac{m^4}{n^2 p^2} \right)$$

$$66. \frac{2}{3} \ln \left[\frac{(x-5)^6}{x} \right]$$

$$90. \log_{10} = \frac{1}{\log_{10}}$$

$$\log_e 10 \times \log_{10} e = 1$$

$$96. \log\left(\frac{1}{1}\right) \neq \frac{\log 10}{\log 1}$$

4.5

$$8. w = \frac{1}{2}$$

$$15. t = \frac{19}{9}$$

$$20. y = \log 772$$

$$32. x = \ln 8$$

$$39. x = 2 \quad x = -9$$

$$56. x = 7 \quad x = 1$$

$$88. f(x) = 5^x + 6$$

$$y = 5^x + 6$$

$$x = 5^y + 6$$

$$x - 6 = 5^y$$

$$\log_5(x-6) = y \log_5 5$$

$$y = \log_5(x-6)$$

$$5^{y+1} = 5 \cdot 5^y = 5(x-6)$$

$$99. \quad x = 2 \quad x = -2$$

$$6x^2 - 2x = 36$$

$$6x^2 - 2x = 6^2$$

$$x^2 - 2 = 2$$

$$x^2 - 4 = 0$$

$$(x-2)(x+2)$$