

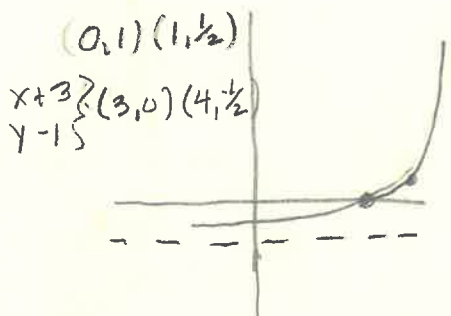
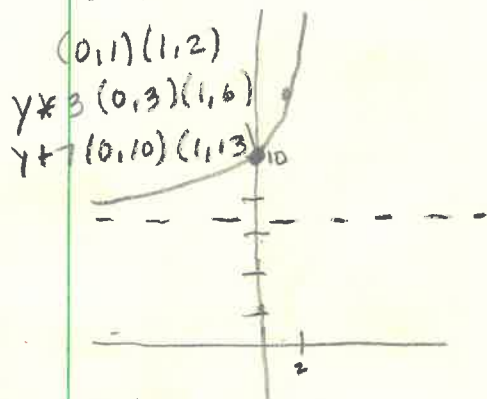
HMH WB p 117 1-4, 7, 10, p 125 1, 4, 5, 8, 9, 12.

p 129 1-11 p 133 1, 3-8, 11-13, p 141 1-6, p 145 1-6, 9, 10, 12

p 117

1) $g(x) = 3(2)^x + 7$

2) $g(x) = (\frac{1}{2})^{x-3} - 1$

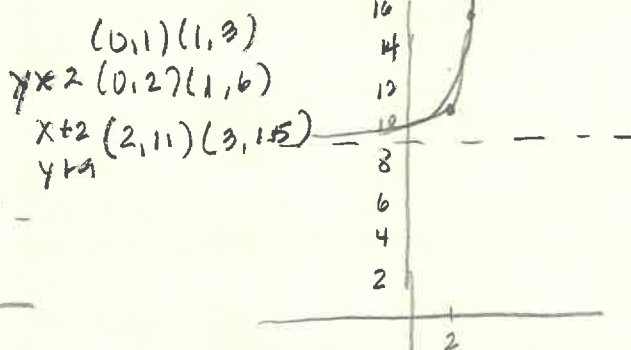
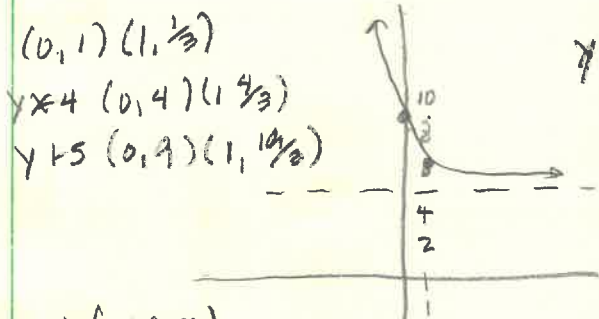


$D(-\infty, \infty)$
 $R(7, \infty)$
 $A y = 7$

$D(-\infty, \infty)$
 $R(-1, \infty)$
 $A y = -1$

3) $g(x) = 4(\frac{1}{3})^x + 5$

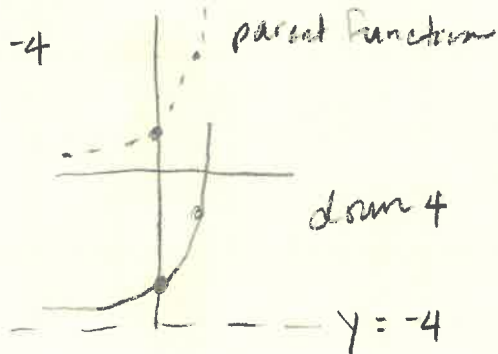
4) $g(x) = 2(3)^{x-2} + 9$



$D(-\infty, \infty)$
 $R(5, \infty)$
 $A y = 5$

$D(-\infty, \infty)$
 $R(9, \infty)$
 $A y = 9$

7) $y = -4$



10) C, F

P125

$$1) A = 800(1.03)^4$$

$$= 900.41$$

$$4) A = 375e^{.0115 \cdot 5}$$

$$= 397.19$$

$$5) 700 = P(1.035)^3$$

$$\frac{700}{(1.035)^3} = P$$

$$631.36 = P$$

$$8) 1040 = Pe^{.0095 \cdot 4}$$

$$\frac{1040}{e^{.0095 \cdot 4}} = P$$

$$1001.22 = P$$

$$9) \frac{2000}{1.33} = \frac{1500}{(1.025)^t}$$

$$1.33 = (1.025)^t$$

$$\log(1.025)^{1.33} = t$$

$$11.65 \text{ years} = t$$

$$12) 2000 = 1700e^{.0085t}$$

$$1.176 = e^{.0085t}$$

$$\ln 1.176 = .0085t$$

$$0.1625 = .0085t$$

$$19.12 \text{ years} = t$$

P129

$$1) \log_5 y = x$$

$$2) \ln b = 3$$

$$3) \log c = d$$

$$4) \ln 12 = x$$

$$5) 11^w = t$$

$$6) \frac{1}{3}^y = x$$

$$7) e^a = 5$$

$$8) 10^{-2} = a$$

$$9) \log_5\left(\frac{1}{5}\right) = -1 \text{ (NC)} \quad \log_5(3125) = 5$$

$$10) \log_2(32) = 5 \text{ (NC)} \quad \log_2\left(\frac{1}{64}\right) = -6$$

$$11) \log_{\frac{1}{100}}(10000) = -2 \quad \log_{\frac{1}{100}}(.1) = \frac{1}{2}$$

P133

1) $f(x) = 3 \log(x+4) + 1$

vertical stretch of 3
 left 4
 up 1
 A: $x = -4$

3) $g(x) = \frac{1}{10} \log_5(x-3)$

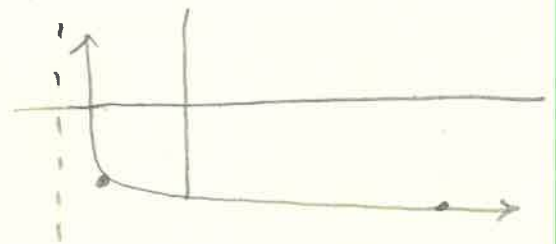
vertical shrink by $\frac{1}{10}$
 right 3
 A: $x = 3$

4) $g(x) = -8 \log_3(x + \frac{1}{2}) - 1$

reflect over x-axis
 left $\frac{1}{2}$
 down 1
 A: $x = -\frac{1}{2}$

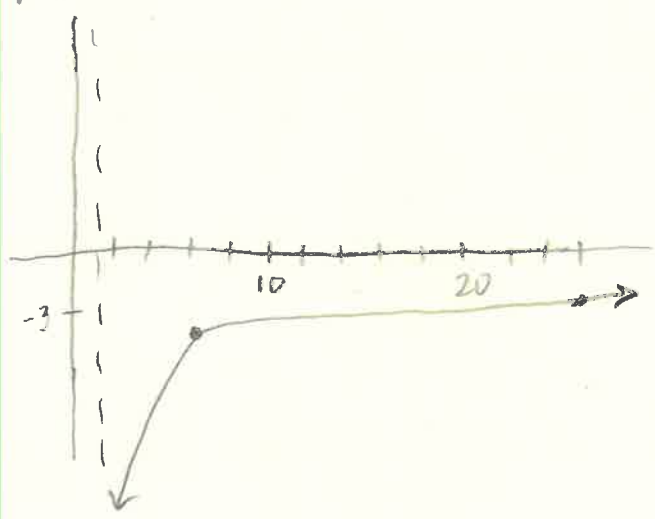
5) $g(x) = -\log(x+3) - 2$

(1,0) (10,1)
 $y \times -1$ (1,0) (10,-1)
 $x-3$ (-2,-2) (7,-3)
 $y-2$



6) $g(x) = 5 \log_5(x-1) - 4$

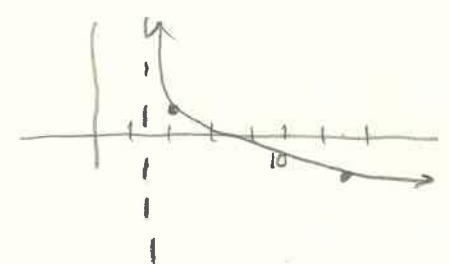
(1,0) (5,1)
 $y \times 5$ (5,0) (25,1)
 $x+1$ (6,-4) (26,-3)
 $y-4$



7) $g(x) = -3 \log(x-3) + 1$

reflect over x-axis
 vertical stretch of 3
 right 3 up 1

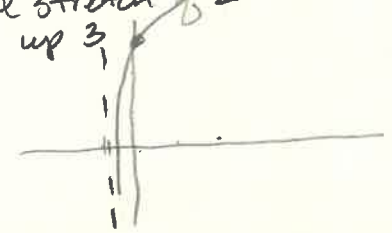
(1,0) (10,1)
 $y \times 3$ (4,0) (16,-3)
 $x+3$ (4,1) (13,-2)
 $y+1$



8) $g(x) = 2 \log_3(x+1) + 3$

vertical stretch of 2
 left 1 up 3

(1,0) (3,1)
 $y \times 2$ (1,0) (3,2)
 $x-1$ (0,3) (2,5)
 $y+3$



$$\log_2 2^5 \quad \log_2 2^3$$

$$5/2 + 3/2 = 4$$

11. log graphs have vertical asymptotes

12. D

13) A

P141

1) $\log_4 32 + \log_4 8$

$$\log_4 (32 \cdot 8)$$

$$\log_4 (2656)$$

$$4$$

2) $\log_6 54 - \log_6 27$

$$\log_6 2$$

$$.387$$

3) $4 \log_2 5 - \log_2 25$

$$\log_2 625 - \log_2 25$$

$$\log_2 \frac{625}{25}$$

$$\log_2 25$$

$$4.64$$

4) $\log_5 81 - 3 \log_5 3$

$$\log_5 81 - \log_5 27$$

$$\log_5 \frac{81}{27}$$

$$\log_5 \frac{4}{3}$$

$$0.18$$

5) $\log_8 80 - 5 \log_8 2$

$$\log_8 80 - \log_8 32$$

$$\log_8 \frac{80}{32}$$

$$\log_8 2.5$$

$$.44$$

6) $\log_3 15 + 3 \log_3 2 - \log_3 10$

$$\log_3 \frac{15 \cdot 2^3}{10}$$

$$= \log_3 \frac{120}{10}$$

$$= \log_3 12$$

$$= 2.26$$

P145

1) $4(6^{x-7}) = 144$

$$6^{x-7} = 36$$

$$6^{x-7} = 6^2$$

$$x-7 = 2$$

$$x = 9$$

2) $8(5^{x+3}) - 54 = 146$

$$8(5^{x+3}) = 200$$

$$5^{x+3} = 25$$

$$5^{x+3} = 5^2$$

$$x+3 = 2$$

$$x = -1$$

$$3) e^{4x} + 15 = 82$$

$$e^{4x} = 67$$

$$\ln 67 = 4x$$

$$4.2 = 4x$$

$$1.05 = x$$

$$4) 3e^{.5x} - 15 = 282$$

$$\frac{3e^{.5x}}{3} = \frac{297}{3}$$

$$e^{.5x} = 99$$

$$\ln 99 = .5x$$

$$4.6 = .5x$$

$$4.12 = x$$

$$5) 7(4^x) + 13 = 90$$

$$7(4^x) = 77$$

$$4^x = 11$$

$$\log_4 11 = x$$

$$1.73$$

$$6) 5(6^x) - 45 = 345$$

$$5(6^x) = 390$$

$$6^x = 78$$

$$\log_6 78 = x$$

$$2.432 = x$$

$$9) A = 31000(1.025)^x$$

$$45000 > 31000(1.025)^x$$

$$1.452 > 1.025^x$$

$$\log_{1.025} 1.452 = x$$

$$x = 15.1 \text{ years}$$

$$10) A = 525(1 - .012)^x$$

$$\frac{260}{525} < \frac{525}{525} (.988)^x$$

$$.381 = .988^x$$

$$\log .988 .381 = x$$

$$x = 79.92 \text{ years}$$

$$12) A = 5000(2)^x$$

$$100000 < 5000(2)^x$$

$$20 < 2^x$$

$$\log_2 20 = x$$

$$x = 4.32$$

(B)