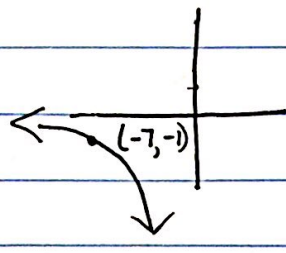
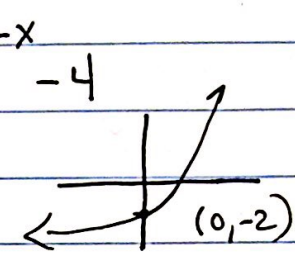


Chapter 3 Practice Test Solutions

1. $f(x) = -e^{x+7}$
 shifted left 7
 (-) flipped down



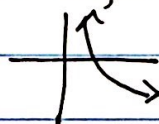
2. $f(x) = 2\left(\frac{3}{5}\right)^{-x} - 4$
 shifted down 4
 stretched by 2



3. $g(x)$ is shifted right 3, up 4

4. $g(x)$ is shifted down 2, reflected across y-axis and x-axis

5. C neg. log graph



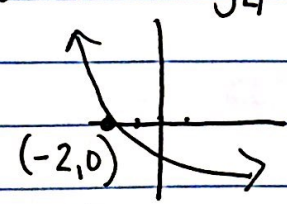
6. $\log_3 \frac{1}{81} = x$
 $3^x = \frac{1}{81}$
 $3^x = 3^{-4}$
 $x = -4$

7. $\log_{32} 2 = x$
 $32^x = 2$
 $2^{5x} = 2^1$
 $5x = 1$
 $x = \frac{1}{5}$

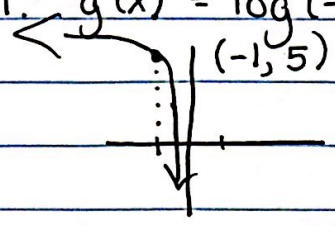
8. $\log_{10} 10^{12} = x$ Rewrite as Exp.
 $10^x = 10^{12}$
 $x = 12$

9. $9^{\log_9 5.3} = x$ Rewrite as log.
 $\log_9 x = \log_9 5.3$
 $x = 5.3$

10. $f(x) = -\log_4 (x+3)$



11. $g(x) = \log(-x) + 5$



12. $P(t) = 1500(1 + .08)^{12(n)}$

a. $1500(1 + \frac{.08}{12})^{12(12)^n} = 3905.08$

b. * use Pe^{rt} $1500e^{.08(12)} = 3917.54$

c. $1500(1 + \frac{.08}{365})^{365t} = 3000$ ← double initial
 $y_1 = y_2$ use calculator to find pt.
 $x = 8.67$ yrs. of intersection

$$\begin{aligned}
 13. \log_6 36xy^2 &= \log_6 36 + \log_6 x + \log_6 y^2 \\
 &= 2\log_6 6 + \log_6 x + 2\log_6 y \\
 &= 2 + \log_6 x + 2\log_6 y
 \end{aligned}$$

*Note $\log_6 6 = 1$

$$\begin{aligned}
 14. \log_3 \frac{a\sqrt{b}}{12} &= \log_3 a\sqrt{b} - \log_3 12 \\
 &= \log_3 a + \log_3 \sqrt{b} - \log_3 12 \\
 &= \log_3 a + \frac{1}{2}\log_3 b - \log_3 12
 \end{aligned}$$

15. OMIT

$$\begin{aligned}
 16. 2\log_4 m + 6\log_4 n - 3(\log_4 3 + \log_4 j) \\
 &= \log_4 m^2 + \log_4 n^6 - 3\log_4 (3j) \\
 &= \log_4 m^2 + \log_4 n^6 - \log_4 (3j)^3 \\
 &= \log_4 \frac{m^2 n^6}{(3j)^3}
 \end{aligned}$$

$$\begin{aligned}
 17. 1 + \ln 3 - 4 \ln x & \quad \text{*Note } \ln e = 1 \\
 \ln e + \ln 3 - \ln x^4 \\
 \ln \left(\frac{3e}{x^4} \right)
 \end{aligned}$$

$$\begin{aligned}
 18. 3^{x+8} &= 9^{2x} \\
 3^{x+8} &= 3^{4x} \\
 x+8 &= 4x \\
 8 &= 3x \\
 \boxed{\frac{8}{3} = x}
 \end{aligned}$$

$$\begin{aligned}
 19. e^{2x} - 3e^x + 2 &= 0 \\
 u = e^x \quad u^2 - 3u + 2 &= 0 \\
 (u-2)(u-1) &= 0 \\
 u=2 \quad u=1 & \quad \text{Replace } u \\
 e^x = 2 \quad e^x = 1 & \quad \text{Rewrite as } \ln
 \end{aligned}$$

$$\boxed{\ln 2 = x \quad \ln 1 = x}$$

$$\begin{aligned}
 20. \log x + \log(x-3) &= 1 \\
 \log(x^2 - 3x) &= 1 \\
 10^1 &= x^2 - 3x
 \end{aligned}$$

$$\begin{aligned}
 0 &= x^2 - 3x - 10 \\
 0 &= (x-5)(x+2) \\
 \boxed{x=5} \quad x \neq -2
 \end{aligned}$$

$$\begin{aligned}
 21. \log_2(x-1) + 1 &= \log_2(x+5) \\
 \log_2(x-1) - \log_2(x+5) &= -1
 \end{aligned}$$

$$\begin{aligned}
 \log_2 \frac{(x-1)}{(x+5)} &= -1 \\
 2^{-1} &= \frac{x-1}{x+5} \\
 \frac{1}{2} &= \frac{x-1}{x+5} \quad \rightarrow \quad \boxed{3=x}
 \end{aligned}$$

#22j