

Chapter 5 Practice Test

1. Rewrite $14^{x+2} = 33$ in logarithmic form.

$$\log_{14} 33 = x+2$$

2. Rewrite $\log_2(x-3) = 4b$ in exponent form.

$$2^{4b} = x-3$$

For #3 & 4 describe the transformations from the parent function $f(x) = 3^x$

3. $g(x) = 4 - 3^{x+2} \rightarrow -3^{x+2} + 4$

U4, over x-axis,
L2

4. $g(x) = -2 + 3^{-x} \rightarrow 3^{-x} - 2$

over y-axis, D2

Solve for x

5. $e^{2x} = e^{x^2-63}$

$$2x = x^2 - 63$$

$$0 = x^2 - 2x - 63$$

$$0 = (x-9)(x+7)$$

$$\boxed{x = 9, -7}$$

8. $e^x = 21$

$$\ln 21 = x$$

$$\boxed{x \approx 3.04}$$

6. $4(7)^x - 4 = 360$

$$4(7^x) = 364$$

$$7^x = 91$$

$$\log_7 91 = x \rightarrow \frac{\log 91}{\log 7}$$

$$\boxed{x \approx 2.32}$$

9. $\log(x) + \log(x+4) = \log(x+40)$

$$\log(x(x+4)) = \log(x+40)$$

$$x^2 + 4x = x + 40$$

$$x^2 + 3x - 40 = 0$$

$$(x+8)(x-5) = 0$$

$$\cancel{x = -8}, \boxed{x = 5}$$

12. $\log_{22} 5 = x$

$$\frac{\log 5}{\log 22} = x$$

$$\cancel{x \approx 0.224}$$

$$\boxed{x = 0.52}$$

15. $3^{2x+1} = 81^{x-1}$

$$\cancel{3}^{2x+1} = \cancel{3}^{4(x-1)}$$

$$2x+1 = 4x-4$$

$$5 = 2x$$

$$\boxed{5/2 = x}$$

7. $\left(\frac{1}{3}\right)^x = 9^{x+3}$

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

$$-x = 2x + 6$$

$$-3x = 6$$

$$\boxed{x = -2}$$

10. $3e^{2x+2} = 63$

$$e^{2x+2} = 21$$

$$\ln 21 = 2x+2$$

$$3.04 = 2x+2$$

$$1.04 = 2x$$

$$\boxed{0.52 = x}$$

11. $\log_3(x+5) - \log_3(x-3) = 3$

$$\log_3 \left(\frac{x+5}{x-3} \right) = 3$$

$$3^3 = \frac{x+5}{x-3} \quad \begin{matrix} \nearrow \\ 27x- \end{matrix}$$

$$27(x-3) = x+5$$

14. $30 = 2^{x-5} - 21$

$$51 = 2^{x-5}$$

$$\log_2 51 = x-5$$

$$\frac{\log 51}{\log 2} = x-5$$

$$5.67 = x-5$$

$$\boxed{10.67 = x}$$

13. $\log_5 x = 3.4$

$$5^{3.4} = x$$

$$\boxed{x = 237.96}$$

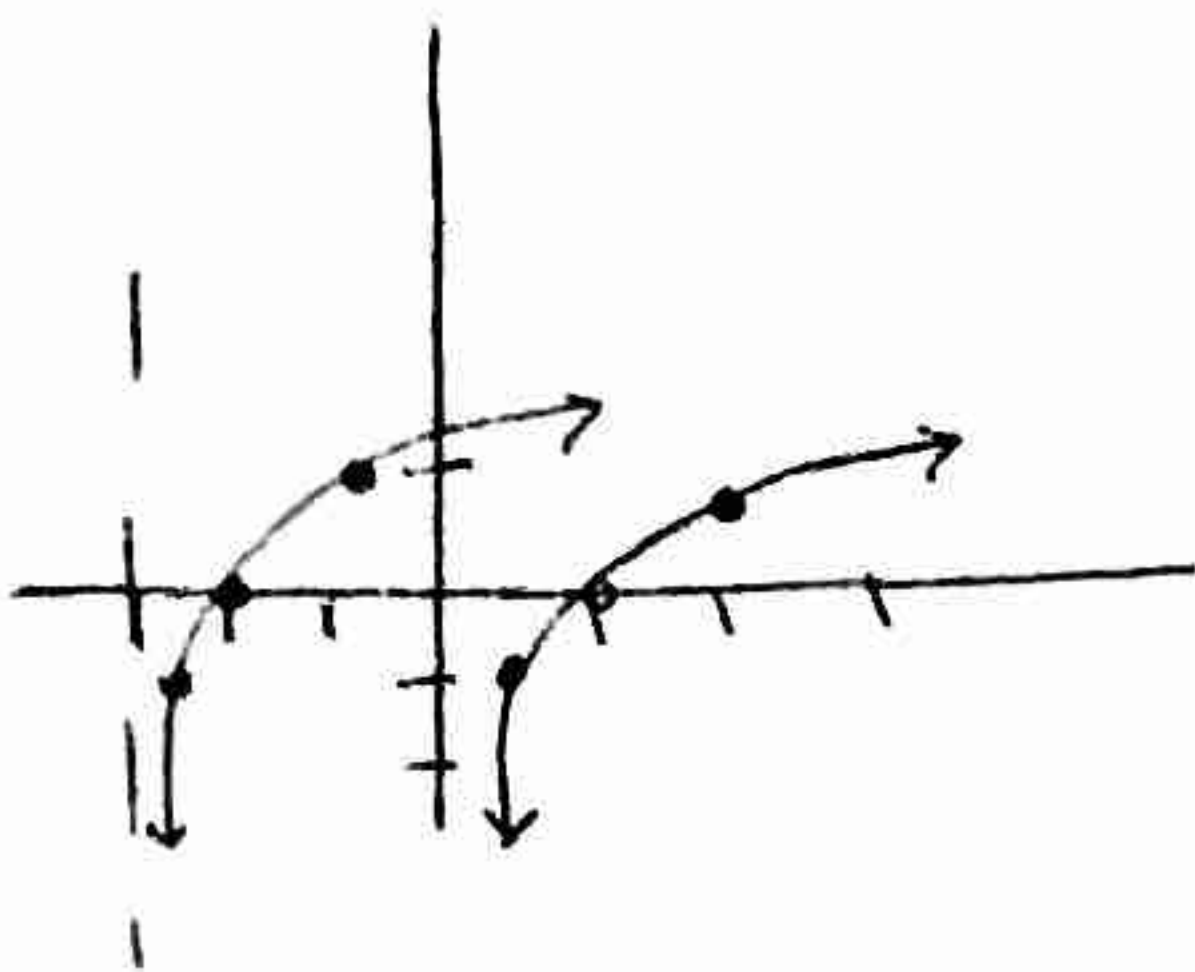
L3

16. Graph $y = \log_2(x+3)$ and state the asymptote, x-intercept and domain

x	y
-1	1/2
0	1
1	2

→

x	y
1/2	-1
1	0
2	1



Rewrite as a single log

17. $\frac{1}{3} \log x + 2 \log y - \log z + 4 \log b$

$$\log x^{1/3} + \log y^2 - \log z + \log b^4$$

$$\log \left(\frac{x^{1/3} y^2 \cdot b^4}{z} \right)$$

18. $2 \ln c - \ln b + 3 \ln d$

$$\ln \left(\frac{c^2}{b} \cdot d^3 \right)$$

Use the properties of logs to expand the expression as a sum or difference of logs with no exponents

19. $\log_4 64x^3y$

$$\log_4 64 + 3 \log_4 x + \log_4 y$$

$$3 + 3 \log_4 x + \log_4 y$$

20. $\log \frac{3x^4}{y^3}$

$$\log 3 + 4 \log x - 3 \log y$$

21. You have \$2,200 to invest in two different banks. Bank A pays 6.2% annual interest compounded quarterly and bank B pays 6.15% compounded continuously.

a. Write an equation modeling the situation for both banks.

Bank A: $y = 2,200 \left(1 + \frac{0.062}{4} \right)^{4t}$

Bank B: $y = 2,200 e^{0.0615t}$

b. How much money will you have in the bank after 5 years?

A: ~~\$2,200~~
\$2,992.41

B: \$2,999.54

c. How long will it take you to reach \$5,000 in bank A?

~~$5000 = 2,200 \left(1 + \frac{0.062}{4} \right)^{4t}$~~

d. How long will it take you to triple your money in bank B?

$$6,600 = 2,200 e^{0.0615t}$$

$$3 = e^{0.0615t}$$

$$\ln 3 = 0.0615t$$

$$t = 17.72 \text{ yrs}$$