

3.4

p228

2. $2^x = 64$

$2^x = 2^6$

$x = 6$

Write 64 as
a base of 2

4. $4^x = \frac{1}{256}$

$4^x = 4^{-4}$

$x = -4$

Write $\frac{1}{256}$ as
a base of 4

$4^4 = 256$

8. $\log_5 5x = 2$

$5^{\log_5 5x} = 5^2$

$\frac{5x}{5} = \frac{25}{5}$

$x = 5$

Raise both
sides to the
power of 5
Solve

10. $\ln(2x-1) = 0$

$e^{\ln(2x-1)} = e^0$

$2x-1 = 1+1$

$\frac{2x}{2} = \frac{2}{2}$

$x = 1$

3.4
p228

12. ~~$\ln e$~~ ^{$2x-1$}

$$2x-1$$

14. ~~$\log_{10} 10$~~ ^{$2x+3$}

$$2x+3$$

16. ~~$\log_8 8$~~ ^{x^5} + 1

$$x^5 + 1$$

22. ~~\log_7~~ ^{$(3x+7)$}

$$3x+7$$

3.4

p 228

24.

$$\frac{2(5^x)}{2} = \frac{32}{2}$$

Isolate the term with the unknown

$$5^x = 16$$

$$\log_5 5^x = \log_5 16$$

take logs
on both sides
to get x into
the numerator

$$x = \log_5 16$$

use change
of base in

$$x = \frac{\log 16}{\log 5}$$

base 10
(calculator)

$$x = \frac{1.204}{.699}$$

$$x \approx 1.723$$

$$28. \quad 6^x + 10^{-10} = 47^{-10}$$

$$6^x = 37$$

$$\log_6 6^x = \log_6 37$$

$$x = \log_6 37$$

$$x = \frac{\log 37}{\log 6}$$

$$x = \frac{1.568}{.778}$$

$$x \approx 2.014$$

34
p228

$$36. \quad 8^{-2-x} = 431$$

$$\log_8 8^{-2-x} = \log_8 431$$

$$-2-x = \log_8 431$$

$$-2-x = \frac{\log 431}{\log 8}$$

$$-2-x = 2.917$$

$$\begin{array}{r} +2 \\ -x = 4.917 \end{array}$$

$$\begin{array}{r} -1 \\ x = -4.917 \end{array}$$

$$38. \quad \frac{8(3^{6-x})}{8} = \frac{40}{8}$$

$$3^{6-x} = 5$$

$$\log_3 3^{6-x} = \log_3 5$$

$$6-x = \log_3 5$$

$$6-x = \frac{\log 5}{\log 3}$$

$$6-x = 1.465$$

$$\begin{array}{r} -6 \\ -x = -4.535 \end{array}$$

$$\begin{array}{r} -1 \\ x = 4.535 \end{array}$$