3.6	#15-39odd	Solving polynomial inequalities
	#47, 53-61odd	Solving rational inequalities
3.7:	#23-37 odd	Variation
4.1	#17-23 odd	prove f is one-to-one; prove g is not one-to-one
	#59-63 odd	determine if f is on-to-one and if so, determine its inverse
	#77-81 odd	sketch the inverse function by reflecting over y=x
	#83-87 odd	use composition to show that the functions are inverses
4.2	#5-10all	match an exponential function to its graph
	#11-41odd	sketch graphs of exponential functions using transformations
	#43a,b,c,45,47	compound interest word problems
4.3	#1-8all	sketch graphs of logarithmic functions
	#9-33odd	evaluate log expressions without a calculator
	#35-53 odd	convert between logarithmic and exponential expressions
	#69-77 odd	apply change of base formula & calculator to approximate log expressions
	#83-90 all	graph logarithmic functions using transformations

4.4 # 31,33, 49-55 odd; 65-75 odd; 107 applying log rules

4.5 # 1-25 odd; solving exponential equations; #27-47 odd solving logarithmic equations

4.6 #5,7,9,15,17 application problems

$$f(x) = \frac{x}{x-5}$$

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

$$(y-5)\,x = \frac{y}{y-5}\cdot(y-5)$$

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

$$xy - 5x = y$$

$$xy - y = 5x$$

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

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

$$f^{-1}(x) = \frac{5x}{x-1}$$

$3^{2\log_3 4}$

$3^{\log_3 4^2} = 4^2 = 16$

f & g are inverses if
$f(g(x)) = x$ & $g(f(x)) = x$
$f(x) = \log_a x$; $g(x) = a^x$

$\log_a(a^x) = x$

$a^{(\log_a x)} = x$

$\log_a \sqrt{\frac{a^6 b^8}{a^2 b^5}} = \log_a \sqrt{a^4 b^3} =$

$= \log_a (a^4 b^3)^{1/2} = \log_a (a^2 b^{3/2})$

$= \log_a a^2 + \log_a b^{3/2}$

$= 2 + \frac{3}{2}\log_a b$

Determine whether the statement is true. Assume that a, x, M, and N are positive.

102. $\log_N (MN)^x = x \log_N M + x$

$LHS = \log_N (MN)^x = \log_N (M^x N^x)$

$= \log_N M^x + \log_N N^x$

$= x \log_N M + x = RHS$ ✓

Write without using logarithms.

106. $\log_a x + \log_a y - mz = 0$

$\log_a (xy) - mz = 0$

$\log_a (xy) = mz$

$a^{mz} = xy$

$\log_a b = c \iff a^c = b$

4.5 Solving Exponential & Logarithmic Equations

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

$\log_3(3^{2x}) = \log_3 3^5$

$2x = 5$

$x = 5/2$

$\log_3 2x = \log_3 5$

$3^{\log_3 2x} = 3^{\log_3 5}$

$2x = 5$

$x = 5/2$

For any $a > 0, a \neq 1$,

$\boxed{a^x = a^y \leftrightarrow x = y}$

Similarly, for M,N>0, $a > 0, a \neq 1$,

$\boxed{\log_a M = \log_a N \leftrightarrow M = N}$

$2^x = 7$

$\log_2 2^x = \log_2 7$

$\boxed{x = \log_2 7}$

$\ln(2^x) = \ln 7$

$x \ln 2 = \ln 7$

$\boxed{x = \frac{\ln 7}{\ln 2}}$

$e^{50t} = 300$

$\ln(e^{50t}) = \ln 300$

$50t = \ln 300$

$\boxed{t = \frac{(\ln 300)}{50}}$

$\neq \ln \frac{300}{50}$

$(\ln 300)/50$

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

$\log[x(x+3)] = 1$

$\log_{10}(x^2+3x) = 1$

$10^1 = x^2+3x$

$0 = x^2+3x-10$

$0 = (x+5)(x-2)$

$\log_a b = c \Leftrightarrow a^c = b$

$\Rightarrow x = \cancel{-5}, 2$

4. $3^{7x} = 27$

$3^{7x} = 3^3$

$7x = 3$

$x = 3/7$

10. $3^{x^2+4x} = \frac{1}{27} = \frac{1}{3^3}$

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

$x^2+4x = -3$

$x^2+4x+3 = 0$

$(x+3)(x+1) = 0$

$x = -3, -1$