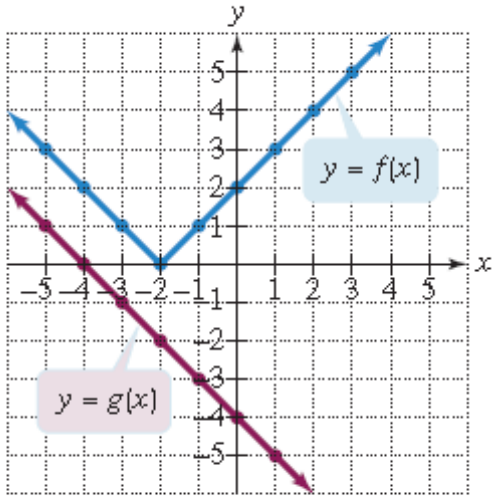

61. $(f \circ g)(-1)$

62. $(f \circ g)(1)$

63. $(g \circ f)(0)$

64. $(g \circ f)(-1)$

in clicker.

$g(f(-1))$

$g(1) = -5$

43. ~~$f(x)$~~ $y = \sqrt[3]{x-4} + 3$

$x = \sqrt[3]{y-4} + 3$

$(x-3)^3 = \left(\sqrt[3]{y-4}\right)^3$

$(x-3)^3 = y-4$

$(x-3)^3 + 4 = y = f^{-1}(x)$

$f(f^{-1}(x)) = x$

$\sqrt[3]{(x-3)^3 + 4 - 4} + 3$

$\sqrt[3]{(x-3)^3} + 3$

$x - 3 + 3$

x

42. $y = f(x) = \dfrac{2x - 3}{x + 1}$

$(y+1)x = \dfrac{2y-3}{y+1}(y+1)$

$xy + x = 2y - 3$

$xy - 2y = -x - 3$

$y(x-2) = -x - 3$

$f^{-1}(x)$ $y = \dfrac{-x-3}{x-2}$

$y = \dfrac{x+3}{2-x}$

14.3 leave graphing for tomorrow

$\sqrt{x} = x^{\frac{1}{2}}$

radical form = fractional exponent form

$\sqrt{36} = \sqrt[2]{6^2}$

2 forms of an equation

exponential		logarithmic
$2^3 = 8$	$\longrightarrow$	$\log_2(8) = 3$
$3^4 = 81$	$\longleftarrow$	$\log_3 81 = 4$
$4^{\frac{1}{2}} = 2$	$\longrightarrow$	$\log_4(2) = \frac{1}{2}$
$\sqrt{4} = 2$		
$\sqrt[3]{8} = 2$	$\longrightarrow$	$\log_8(2) = \frac{1}{3}$
$8^{\frac{1}{3}} = 2$	$\longrightarrow$	

$\log_a 3 = 7 \longrightarrow$ exponential form $a^7 = 3$

$\sqrt[4]{b} = 6 \longrightarrow$ log form

$b^{\frac{1}{4}} = 6 \longrightarrow \log_b(6) = \frac{1}{4}$

Simplify w/out a calculator

$\log_2 16 = x$

$2^x = 16$

$2^x = 2^4$

$x = 4$

$\log_2 \frac{1}{\sqrt{2}} = x$

$2^x = \frac{1}{\sqrt{2}}$

$2^x = \frac{1}{2^{\frac{1}{2}}}$

$2^x = 2^{-\frac{1}{2}}$

$x = -\frac{1}{2}$

$\log_3 27 = x$

$3^x = 27$

$3^x = 3^3$

$x = 3$

$\log_3 \sqrt[3]{3} = x$

$3^x = \sqrt[3]{3}$

$3^x = 3^{\frac{1}{3}}$

$x = \frac{1}{3}$

$\log_4 32 = x$

$4^x = 32$

$(2^2)^x = 2^5$

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

$2x = 5$

$x = \frac{5}{2}$

Calculators can only do 2 Bases

① Base 10 = Common log

$\log_{10} X = \log X$

$\log_{10}(10{,}000) = 4$

$\log(100) = 2$

$2 < \log_{10} 500 < 3$

2.699

(2) natural number $e \approx 2.72$

$\log_e x = \ln x$

$\ln e^1 = 1$

$\ln 1 = 0$

$\ln_e 0 =$ undef

Inverse functions

$f(x) = y = 2^x$ exponential

find the inverse

① swap x & y

$x = 2^y$

② solve for y

By changing to log form

$f^{-1}(x) = \log_2 x = y$

$\sqrt[3]{x^3} = x$

$(\sqrt[3]{x})^3 = x$

$\log_2(2^x) = x$

$2^{\log_2 x} = x$

$f(x) = \sqrt[5]{x}$

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

$g(x) = 3^x$

$g^{-1}(x) = \log_3 x$

$\log_3(3^x)$

x

$\log_3 3^7 = 7$

$\ln e^2 = 2$

$9^{\log_9 5} = 5$

$\log 10^5 = 5$

$$\log_{10}(10^5) = x$$

$$10^x = 10^5$$

$$x = 5$$

$5^{\log_5 7} = x$

Change to log form

$\log_5 x = \log_5 7$

$x = 7$

$\ln\left(\frac{1}{e^7}\right)$

$\ln\left(e^{-7}\right)$

-7

$\log_e\left(\frac{1}{e^7}\right) = x$

$e^x = \frac{1}{e^7}$

$e^x = e^{-7}$

$x = -7$

$\log_{81} 9 = x$

$81^x = 9$

$\left(9^2\right)^x = 9^1$

$9^{2x} = 9^1$

$2x = 1 \quad x = \frac{1}{2}$

$$\log_3\left(\log_7 7^1\right)$$

$$\log_3(1)$$

$$0$$