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(35) $e^x + e^{-x} = 3$

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

$\frac{e^{2x}}{e^x} + \frac{1}{e^x} = 3$

$e^x \cdot \frac{e^{2x}+1}{e^x} = 3 \cdot e^x$

$e^{2x} + 1 = 3e^x$

$-3e^x \quad -3e^x$

$e^{2x} - 3e^x + 1 = 0$

$e^x = \frac{3 \pm \sqrt{9-4}}{2}$

$e^x = \frac{3 \pm \sqrt{5}}{2}$

$x = \ln\left(\frac{3 \pm \sqrt{5}}{2}\right)$

$\frac{e^x}{1} \cdot \frac{e^x}{e^x}$

$x^2 \cdot x^3 = x^5$

$ax^2 + bx + c = 0$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$(e^x)^2 - 3e^x + 1$

(43) $f(x) = \frac{100}{1+2^{-x}}$

$x = \frac{100}{1+2^{-y}}$

$1 + 2^{-y} = \frac{100}{x}$

$-1 \qquad -1$

$2^{-y} = \frac{100}{x} - 1$

$\log_2 2^{-y} = \log_2\left(\frac{100}{x} - 1\right)$

$-y = \log_2\left(\frac{100}{x} - 1\right)$

$y = -\log_2\left(\frac{100}{x} - 1\right)$

$\ln 2^{-y} = \ln\left(\frac{100}{x} - 1\right)$

$\frac{-y \ln 2}{-\ln 2} = \frac{\ln\left(\frac{100}{x} - 1\right)}{-\ln 2}$

$y = \frac{\ln\left(\frac{100}{x} - 1\right)}{-\ln 2}$

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43 cont. $y = -\log_2\left(\frac{100}{x} - 1\right)$

$$f(f^{-1}(x)) = \frac{100}{1 + 2^{-(-\log_2(\frac{100}{x} - 1))}}$$

$$= \frac{100}{1 + 2^{\log_2(\frac{100}{x} - 1)}}$$

$$= \frac{100}{1 + (\frac{100}{x} - 1)}$$

$$= \frac{100}{\frac{100}{x}} \qquad \frac{100}{1} \cdot \frac{x}{100}$$

$$= x \qquad \frac{100}{1} \cdot \frac{1 + 2^{-x}}{100}$$

$$f^{-1}(f(x)) = -\log_2\left(\frac{\frac{100}{1+2^{-x}}}{\frac{100}{1+2^{-x}}} - 1\right)$$

$$= -\log_2(1 + 2^{-x} - 1)$$

$$= -\log_2(2^{-x})$$

$$= -(-x)$$

$$= x$$

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23) $f(x) = \frac{2x+1}{x+3}$

$(y+3)x = \left(\frac{2y+1}{y+3}\right)(y+3)$

$xy + 3x = 2y + 1$

$-2y \quad -3x \quad -2y \quad -3x$

$xy - 2y = 1 - 3x$

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

$f(f^{-1}(x)) = \frac{2\left(\frac{1-3x}{x-2}\right)+1}{\left(\frac{1-3x}{x-2}\right)+3} \cdot \frac{x-2}{x-2}$

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

$= \frac{2-6x+x-2}{1-3x+3x-6}$

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

$f^{-1}(f(x)) = \frac{1-3\left(\frac{2x+1}{x+3}\right)}{\left(\frac{2x+1}{x+3}\right)-2} \cdot \frac{x+3}{x+3}$

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

$= \frac{x+3-6x-3}{2x+1-2x-6}$

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

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45 (a) $f^{-1}(f(x)) = f(f^{-1}(x)) = \sqrt{1-(\sqrt{1-x^2})^2}$

$1-(1-x^2)$

$f(x) = \sqrt{1-x^2}$

$f^{-1}(x) = \sqrt{1-x^2}$

$= \sqrt{1-1+x^2}$

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

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

$f(x) = \dfrac{1}{x}$

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

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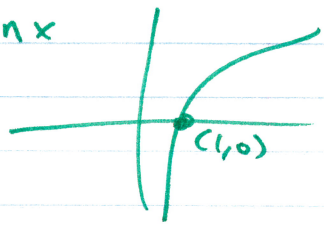
(39) $y = 2\ln(3-x) - 4$

$y = \ln x$



$x^2 \cdot x^3 = x^5$

(36) $2^x + 2^{-x} = 5$

$2^x\left(2^x + \frac{1}{2^x}\right) = 5 \cdot 2^x$

$2^{2x} + 1 = 5 \cdot 2^x$

$2^{2x} - 5 \cdot 2^x + 1 = 0$

$x^2 - 5x + 1$

$x = \frac{-b}{}$

~~$a=1 \quad b=-5 \quad c=1$~~

$u = 2^x$

$(2^x)^2 - 5 \cdot 2^x + 1 = 0$

$u^2 - 5u + 1 = 0$

$a=1 \quad b=-5 \quad c=1$

$u = 2^x = \frac{5 \pm \sqrt{25-4}}{2}$

$\log_2 2^x = \log_2 \frac{5 \pm \sqrt{21}}{2}$

$x =$