Tic Tac Toe

Chapter 7: Inverse

My p

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One person picks a box they would like to claim. Both of you evaluate BOTH problems. If the original person is correct, they get the square. If they are wrong, the opponent gets the box. YOU MUST JUSTIFY YOUR ANSWER (show +s and -s, who won the game, etc)!!!

Find an equation for the inverse. $y = 3 - 2x$ $x = 3 - 2y$ $x - 3 = -2y$ $\frac{x-3}{-2} = y$ $f^{-1}(x) = \frac{x-3}{-2}$	Verify that f and g are inverse functions. $f(x) = 2x + 7 \quad g(x) = \frac{1}{2}x - \frac{7}{2}$ $f(g(x)) = 2\left(\frac{1}{2}x - \frac{7}{2}\right) + 7$ $= 1x - 7 + 7$ $= x$ $g(f(x)) = \frac{1}{2}(2x + 7) - \frac{7}{2}$ $= 1x + \frac{7}{2} - \frac{7}{2}$ $= x$	Find an equation for the inverse. $y = x^2 + 3$ $x = y^2 + 3$ $x - 3 = y^2$ $\sqrt{x-3} = y$ $f^{-1}(x) = \sqrt{x-3}$
Verify that f and g are inverse functions. $f(x) = 1 - x \quad g(x) = 1 - x$ $f(g(x)) = 1 - (1 - x)$ $= 1 - 1 + x$ $= x$ $g(f(x)) = 1 - (1 - x)$ $= 1 - 1 + x$ $= x$	Find an equation for the inverse. $y = \sqrt[3]{5x - 3}$ $x^3 = 5y - 3$ $x^3 + 3 = 5y$ $\frac{x^3+3}{5} = y$ $f^{-1}(x) = \frac{x^3+3}{5}$	Find an equation for the inverse. $y = \sqrt{x}$ $x^2 = y$ $f^{-1}(x) = x^2$
Find an equation for the inverse. $y = x^2 + 7, x \geq 0$ $x - 7 = y^2$ $\sqrt{x-7} = y$ $f^{-1}(x) = \sqrt{x-7}$	Find an equation for the inverse. $y = 4x^2$ $x = 4y^2$ $\sqrt{\frac{x}{4}} = \sqrt{y^2}$ $\frac{\sqrt{x}}{2} = y$ $f^{-1}(x) = \frac{\sqrt{x}}{2}$	Verify that f and g are inverse functions. $f(x) = \frac{1}{2}x^3 \quad g(x) = \sqrt[3]{2x}$ $f(g(x)) = \frac{1}{2}(\sqrt[3]{2x})^3$ $= \frac{1}{2}(2x)$ $= 1x$ $= x$ $g(f(x)) = \sqrt[3]{2\left(\frac{1}{2}x^3\right)}$ $= \sqrt[3]{x^3}$ $= x$

Our winner is: _____!!

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Verify that f and g are inverse functions.

$f(x) = -3x + 6 \quad g(x) = \frac{-1}{3}x + 2$

$f(g(x)) = -3\left(-\frac{1}{3}x+2\right)+6$

$= 1x - 6 + 6$

$= 1x$

$= x$ ☑

$g(f(x)) = -\frac{1}{3}(-3x+6) + 2$

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

$= 1x - 2 + 2$

$= x$ ☑

Verify that f and g are inverse functions.

$f(x) = \frac{3}{5}x - 15$

$g(x) = \frac{5}{3}x + 25$

$f(g(x)) = \frac{3}{5}\left(\frac{5}{3}x+25\right) - 15$

$= 1x + 15 - 15$

$= 1x = x$ ☺

$g(f(x)) = \frac{5}{3}\left(\frac{3}{5}x-15\right) + 25$

$= 1x - 25 + 25$

$= 1x$

$= x$ ☺

yes, f & g are inverses

Verify that f and g are inverse functions.

$f(x) = x - 2 \quad g(x) = x + 2$

$f(g(x)) = (x+2) - 2$

$= x + 2 - 2$

$= 0$

$= x$ ☑

$g(f(x)) = (x-2) + 2$

$= x - 2 + 2$

$= 0$

$= x$ ☑

Verify that f and g are inverse functions.

$f(x) = \frac{2(x+6)}{3} + 10$

$g(x) = \frac{3}{2}x - 21$

$f(g(x)) = \frac{2\left(\left(\frac{3}{2}x-21\right)+6\right)}{3} + 10$

$= \frac{2\left(\frac{3}{2}x-15\right)}{3} + 10 = \frac{3x-30}{3} + 10 = x - 10 + 10 = x$ ☺

$g(f(x)) = \frac{3}{2}\left(\frac{2(x+6)}{3}+10\right) - 21$

$= \frac{3}{2}\left(\frac{2x+12}{3}+10\right) - 21$

$= \frac{2x+12}{2} + 15 - 21$

$= x + 6 - 6$

$= x$ ☺

yes, f & g are inv

Find an equation for the inverse.

$y = 2x^3 + 5$

$x = 2y^3 + 5$

$x - 5 = 2y^3$

$\sqrt[3]{\frac{x-5}{2}} = y$

$f^{-1}(x) = \sqrt[3]{\frac{x-5}{2}}$

Verify that f and g are inverse functions.

$f(x) = \frac{1}{2}x - 4 \quad g(x) = 2x + 8$

$f(g(x)) = \frac{1}{2}(2x+8) - 4$

$= 1x + \frac{8}{2} - 4$

$= 1x + 4 - 4$

$= 0$

$= x$ ☑

$g(f(x)) = 2\left(\frac{1}{2}x-4\right) + 8$

$= 1x - 8 + 8$

$= 0$

$= x$ ☑

Verify that f and g are inverse functions.

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

$f(g(x)) = \left(\sqrt[3]{x}\right)^3$

$= x$ ☑

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

$= x$ ☑

Verify that e and d are inverse functions.

$e(x) = \frac{(x-10)^2}{4}$

$d(x) = 4\sqrt{x} + 10$

$e(d(x)) = \frac{\left((4\sqrt{x}+10)-10\right)^2}{4}$

$= \frac{(4\sqrt{x})^2}{4}$

$= \frac{16 \cdot x}{4}$

$= 4x$ ☹

e & d are not inverses!

Find an equation for the inverse.

$y = \sqrt{x+1} \rightarrow (x)^2 = \left(\sqrt{y+1}\right)^2$

$x^2 = y + 1$

$x^2 - 1 = y$

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

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Inverse Functions

My name: _____
My partner's name: _____
Date: _____Period: _____

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Verify that *f* and *g* are inverse functions. $f(x)=-3x+6 \;\; g(x)=\frac{-1}{3}x+2$	Find an equation for the inverse. $f(x)=-x+5$	Verify that *f* and *g* are inverse functions. $f(x)=x-2 \;\; g(x)=x+2$
Find an equation for the inverse. $f(x)=\frac{1}{2}x+6$	Find an equation for the inverse. $h(x)=2x^3+5$	Verify that *f* and *g* are inverse functions. $f(x)=\frac{1}{2}x-4 \;\; g(x)=2x+8$
Verify that *f* and *g* are inverse functions. $f(x)=x^3 \;\; g(x)=\sqrt[3]{x}$	Find an equation for the inverse. $g(x)=x^2-1$	Find an equation for the inverse. $f(x)=\sqrt{x+1}$

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Inverse Functions

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My partner's name: _____
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Find an equation for the inverse. $f(x)=3-2x$	Verify that *f* and *g* are inverse functions. $f(x)=2x+7 \quad g(x)=\frac{1}{2}x-\frac{7}{2}$	Find an equation for the inverse. $g(x)=x^2+3$
Verify that *f* and *g* are inverse functions. $f(x)=1-x \quad g(x)=1-x$	Find an equation for the inverse. $f(x)=\sqrt[3]{5x-3}$	Find an equation for the inverse. $f(x)=\sqrt{x}$
Find an equation for the inverse. $h(x)=x^2+7, \quad x\geq 0$	Find an equation for the inverse. $g(x)=4x^2$	Verify that *f* and *g* are inverse functions. $f(x)=\frac{1}{2}x^3 \quad g(x)=\sqrt[3]{2x}$