F&T Name _____

Inverse & Solve Radicals

1.) If $f(x)=\frac{3}{4}x+\frac{1}{4}$ find $f^{-1}(x)$.

original

$y=\frac{3}{4}x+\frac{1}{4}$

inverse

$x=\frac{3}{4}y+\frac{1}{4}$

$-\frac{1}{4}\quad -\frac{1}{4}$

$\frac{4}{3}\left(x-\frac{1}{4}\right)=\frac{3}{4}y\cdot\frac{4}{3}$

$\frac{4}{3}x-\frac{1}{3}=y$

2.) What is the inverse of $f(x)=6x-3$?

$y=6x-3$

Inverse

$x=6y-3$

$+3\quad +3$

$\frac{x+3}{6}=\frac{6y}{6}$

$\frac{x}{6}+\frac{3}{6}=y$

$\frac{1}{6}x+\frac{1}{2}=y$

(a) $f^{-1}(x)=\frac{1}{6}x+\frac{1}{2}$

(b) $f^{-1}(x)=\frac{1}{6}x-\frac{1}{2}$

(c) $f^{-1}(x)=6x+\frac{1}{2}$

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

3.) Find the **inverse** of $g(x)=\sqrt[3]{x-3}$

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

Inverse

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

$x^3=y-3$

$x^3+3=y$

4.) Find the **inverse** of $f(x)=x^3-2$

$y=x^3-2$

Inverse

$x=y^3-2$

$+2 \quad +2$

$\sqrt[3]{x+2}=\sqrt[3]{y^3}$

$\sqrt[3]{x+2}=y$

5.) **Solve for** ***x*****:** $\sqrt{2x-7}+x=5$

$\left(\sqrt{2x-7}\right)^2=(-x+5)^2$

$2x-7=(-x+5)(-x+5)$

$2x-7=x^2-5x-5x+25$

$2x-7=x^2-10x+25$

$-2x+7 \quad -2x+7$

$0=x^2-12x+32$ $\quad 16\cdot 2,\ 8\cdot 4$

$0=(x-8)(x-4)$

$x\neq 8 \quad x=4$

check

$\sqrt{2(8)-7}+8=5$

$\sqrt{9}+8=5$

$3+8=5$

$11\neq 5$

$\sqrt{2(4)-7}+4=5$

$\sqrt{8-7}+4=5$

$\sqrt{1}+4=5$

$1+4=5$

$5=5$ ✓

6.) **Solve for** ***x*****:** $\sqrt{56-x}^2=x^2$

$56-x=x^2$

$0=x^2+x-56$

$0=(x+8)(x-7)$

$x\neq 8 \quad x=7$

$\sqrt{56-(-8)}=-8$

$\sqrt{64}=-8$

$8\neq -8$