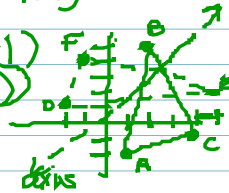


7.2 Inverse Functions + Relations (pg 417)

EX#1 = $\Delta ABC = \{(1, -2), (2, 5), A, -1)\}$
 $\Delta DEF = \{(2, 1), (5, 2), (-1, 4)\}$

a) $\{(8, -3), (-8, -6), (-3, -6)\}$
 $\{(-3, -8), (-6, -8), (-6, -3)\}$

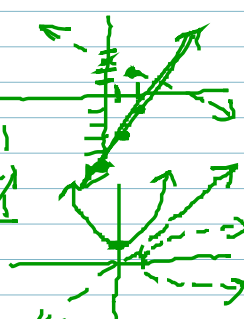


EX#2 = $f(x) = 2x - 5$ Inverse
 $y = 2x - 5$ (switch $x \leftrightarrow y$)

$x = 2y - 5$
 $+5 \quad +5$

$x + 5 = 2y$
 $\frac{1}{2}x + \frac{5}{2} = y$

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



EX#3: $g(x) = \frac{1}{3}x - 3$
 $(f \circ g)(x) = f(g(x))$
 $f(\frac{1}{3}x - 3)$
 $3(\frac{1}{3}x - 3) + 9$
 $x - 9 + 9$
 x

$(g \circ f)(x) = g(f(x))$
 $g(3x + 9)$
 $\frac{1}{3}(3x + 9) - 3$
 $x + 3 - 3$
 x

function are inverses

3) $f(x) = \frac{2}{3}x + 10$
 $x = \frac{3}{2}(y - 10)$
 $-\frac{1}{3}x = y$

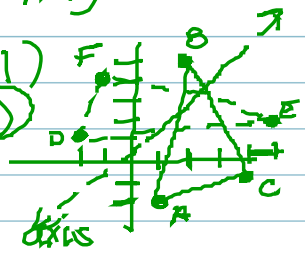


3b) $f(x) = 4x^2$ $g(x) = \sqrt{x}$
 $(f \circ g)(x) = f(g(x)) = f(\sqrt{x}) = 4(\sqrt{x})^2 = 4x$
 $(g \circ f)(x) = g(f(x)) = g(4x^2) = \sqrt{4x^2} = 2|x|$
 Not an inverse

8) $f(x) = \frac{2}{3}x^3$
 $g(x) = \sqrt[3]{\frac{3}{2}x}$
 $(f \circ g)(x) = f(g(x)) = f(\sqrt[3]{\frac{3}{2}x}) = \frac{2}{3}(\sqrt[3]{\frac{3}{2}x})^3 = \frac{2}{3} \cdot \frac{3}{2}x = x$
 Not inverse

7.2 Inverse Functions + Relations (pg 417)

EX#1 = $\Delta ABC = \{(1, -2), (2, 5), (4, -1)\}$
 $\Delta DEF = \{(-2, 1), (5, 2), (-1, 4)\}$



a) $\{(-8, -3), (-8, -6), (-3, -6)\}$
 $\{(-3, -8), (-6, -8), (-6, -3)\}$

EX#2 = $f(x) = 2x - 5$
 $y = 2x - 5$
 $x = 2y - 5$
 $+5 \quad +5$

Inverse (switch x + y)

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

$\frac{1}{2}x + \frac{5}{2} = y$

$f(x) = 3x + 9$

EX#3: $g(x) = \frac{1}{3}x - 3$

$(f \circ g)(x) = f(g(x))$

$f(\frac{1}{3}x - 3)$
 $3(\frac{1}{3}x - 3) + 9$
 $x - 9 + 9$

x

function are inverses

$\frac{1}{3}(3x+9) - 3$
 $x + 3 - 3$

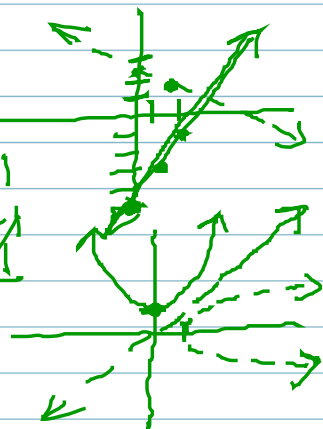
x

3b) $f(x) = 4x^2$ $g(x) = 2\sqrt{x}$

$(f \circ g)(x) = f(g(x))$ $(g \circ f)(x) = g(f(x))$

$f(2\sqrt{x})$
 $4(2\sqrt{x})^2$
 $4(4x)$
 $16x$

Not an inverse



pg 412

7) $f(x) = 2x + 0$

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



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

$(f \circ g)(x) = f(g(x))$
 $f(\frac{1}{3}\sqrt[3]{x})$

$2(\frac{1}{3}\sqrt[3]{x})^3$
 $2(\frac{1}{27}x) \neq x$

Not inverse