Use these two functions.

$f(x) = (x+3)^2 - 1$ $\qquad$ $g(x) = \sqrt{x+1} - 3$

1. Find f(g(x)). Simplify as much as possible.

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

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

2. Find g(f(x)). Simplify as much as possible.

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

$= \sqrt{(x+3)^2} - 3 = x+3-3 = x$

Whenever f(g(x))=x and g(f(x))=x

the functions f(x) and g(x) are called INVERSES

All the operations in f(x) are the inverse operations in g(x).

Given these two functions: $f(x) = 3x^2 - 7$ and $g(x) = 2x+4$

1. Find f(3)

$= 3(3)^2 - 7$

$3(9) - 7$

$27 - 7$

20

2. Find g(3)

$= 2(3) + 4$

$6 + 4$

10

Given these two functions: $f(x) = 3x^2 - 7$ and $g(x) = 2x+4$

a. Find f(g(3))

$g(3) = 10$

$f(10) = 3(10)^2 - 7$

$300 - 7$

$= 293$

b. find g(f(3))

$f(3) = 20$

$g(20) =$

$2(20) + 4$

$= 44$

Use these functions:

$f(x) = 3x^2 - 5x$ $\quad g(x) = \dfrac{3x-2}{x+1}$ $\quad h(x) = 4x - 3$

Find h(g(5))

$g(5) = \dfrac{3(5)-2}{5+1} = \dfrac{13}{6}$

$h\left(\dfrac{13}{6}\right) = 4\left(\dfrac{13}{6}\right) - 3 = \dfrac{26}{3} - \dfrac{3}{1}\cdot\dfrac{3}{3}$

$\dfrac{26}{3} - \dfrac{9}{3} = \dfrac{17}{3}$

Use these functions:

$f(x) = 3x^2 - 5x$ $\quad g(x) = \dfrac{3x-2}{x+1}$ $\quad h(x) = 4x - 3$

Find g(f(h(2)))

$h(2) = 4(2) - 3 = 5$

$f(5) = 3(5)^2 - 5(5) = 50$

$g(50) = \dfrac{3(50)-2}{50+1} = \dfrac{148}{51}$

Hwk #8 Sec 7-6

Due Tomorrow

Pages 400

Problems: 8, 10, 13, 16, 17, 32, 38, 39, 65, 66