HW #1 Math 140

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1. $f(x)=2x+4$, $g(x)=4x^2+1$; find $(g \circ f)(0)$

$(g \circ f)(0) = g(f(0)) = g(4)$

$f(0)=2(0)+4$

$=4$

$= 4(4)^2+1$

$= 4(16)+1$

$= 64+1 = 65$

D) 65

2. $f(x)=-4x+9$, $g(x)=5x+9$; find $(g \circ f)(x)$

$(g \circ f)(x) = g(f(x)) = g(-4x+9)$

$= 5(-4x+9)+9$

$= -20x+45+9$

$= -20x+54$

B) $-20x+54$

3. $f(x)=\sqrt{x+8}$, $g(x)=8x-12$; find $(f \circ g)(x)$

$(f \circ g)(x) = f(g(x)) = f(8x-12)$

$= \sqrt{(8x-12)+8}$

$= \sqrt{8x-4}$

$= \sqrt{4(2x-1)}$

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

B) $2\sqrt{2x-1}$

4. $f(x)=\frac{2}{x-8}$, $g(x)=\frac{5}{8x}$; find $(f \circ g)(x)$

$(f \circ g)(x) = f(g(x)) = f\left(\frac{5}{8x}\right)$

$= \frac{2}{\left(\frac{5}{8x}\right)-8} = \frac{2}{\frac{5}{8x}-\frac{8}{1}}$

$\frac{2 \cdot 8x}{\frac{5}{8x}-8 \cdot 8x} = \frac{16x}{5-64x}$

A) $\frac{16x}{5-64x}$

5. $f(x)=\frac{10}{x+6}$ $\quad g(x)=x+10$

$f(g(x)) = f(x+10) \rightarrow \frac{10}{(x+10)+6} = \frac{10}{x+16}$ $\quad$ D: $x \neq -16$

indicate whether the function is one-to-one:

6. $\{(-18,1),(-19,-8),(3,15)\}$ $\quad$ yes

7. find the inverse of the function & state its domain and range.

$\{(-3,4),(-1,5),(0,2),(2,6),(5,7)\}$

inverse: $\{(4,-3),(5,-1),(2,0),(6,2),(7,5)\}$

domain: 4, 5, 2, 6, 7

range: -3, -1, 0, 2, 5

8 $f(x)=x^3+4$

$y=x^3+4$

$\sqrt[3]{x^3}=\sqrt[3]{y^3+4}$

$\sqrt[3]{x-4}=y$ $\quad f^{-1}(x)=\sqrt[3]{x-4}$

9. $f(x)=\frac{6}{x+4}$

$y=\frac{6}{x+4}$

$6 \cdot x=\frac{6}{y+4} \cdot 6$

$6x=y+4$

$-4 \quad -4$

$y=6x-4$

$f^{-1}(x)=6x-4$

10. graph inverse

inverse function in red