

September 26, 2016

#16) $f(m) = 2m$
 $g(m) = -m - 4$

① find $(f \circ g)(m) = 2(g(m))$
 $= 2(-m - 4)$
 $= -2m - 8$

② find $(f \circ f)(m) = 2(f(m))$
 $= 2(2m)$
 $= 4m$

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9.5 $f(x) = 3x + 1$ & $g(x) = 2x^2 - x + 4$

#37) find $(f \circ g)(x) = f(g(x))$
 $= 3(2x^2 - x + 4) + 1$
 $= 6x^2 - 3x + 12 + 1$
 $= 6x^2 - 3x + 13$

#38) $(f \circ g)(-1) = 6(-1)^2 - 3(-1) + 13$
 $= 6 + 3 + 13$
 $= 9 + 13$
 $= 22$

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#40) $(g \circ g)(x) = g(g(x))$
 $= 2(2x^2 - x + 4)^2 - (2x^2 - x + 4) + 4$
 $= 2[(2x^2 - x + 4)(2x^2 - x + 4)] - 2x^2 + x - 4 + 4$
 $= 2[4x^4 - 2x^3 + 8x^2 - 2x^3 + x^2 - 4x + 8x^2 - 4x + 16] - 2x^2 + x$
 $= 8x^4 - 4x^3 + 16x^2 - 4x^3 + x^2 - 4x + 16x^2 - 8x + 32 - 2x^2 + x$
 $= 8x^4 - 8x^3 + 32x^2 - 15x + 32$

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$g(x) = \frac{1}{x+1}$ & $h(x) = \frac{2}{x}$

#47) $(g \circ h)(x) = \frac{1}{(h(x)) + 1}$
 $= \frac{1}{\frac{2}{x} + 1} = \frac{\frac{1}{1} \cdot x}{\frac{2+x}{x}}$
 $= \frac{1 \cdot x}{2+x}$
 $= \frac{x}{2+x}$

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$(g \circ g)(x) = \frac{1}{g(x) + 1}$
 $= \frac{1}{\frac{1}{x+1} + 1}$
 $= \frac{1}{\frac{1+x+1}{x+1}}$
 $= \frac{1 \cdot x+1}{\frac{2+x}{x+1}}$
 $= 1 \cdot \frac{x+1}{2+x} = \frac{x+1}{x+2}$

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