Math 125 GQ P and Q Rules(7.6)

Name____________________________ Section:________________ Date:_____________

16 points Show ALL work for full credit. Group No:_________

16

1. Use the Quotient Rule to find the derivative of the function. Be sure you simplify as far as possible. This means you need to multiply and simplify all of your Quotient Rule numerator results. Do not expand the denominator. Use appropriate mathematical notation.

$$h(x) = \frac{7x^2 - 1}{x^4 - 2}$$

$$h' = \frac{(x^4-2)(14x) - (7x^2-1)(4x^3)}{(x^4-2)^2}$$

$$= \frac{14x^5 - 28x - 28x^5 + 4x^3}{(x^4-2)^2}$$

$$= \boxed{\frac{-14x^5 + 4x^3 - 28x}{(x^4-2)^2}}$$

(OK factor out 2x from numer.)

2. Given $f(x) = g(x) \bullet h(x)$ and $g(3) = 5$; $g'(3) = 2$; $h(3) = 26$; $h'(3) = 7$, find $f'(3)$.
Use appropriate mathematical notation.

$$f' = gh' + hg' \Rightarrow$$

$$f'(3) = g(3)h'(3) + h(3)g'(3)$$

$$= 5(7) + 26(2)$$

$$= 35 + 52 = \boxed{87}$$

Math 125 GQ P and Q Rules(7.6)..

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1. Use the Quotient Rule to find the derivative of the function. Be sure you simplify as far as possible. This means you need to multiply and simplify all of your Quotient Rule numerator results. Do not expand the denominator. Use appropriate mathematical notation.

$$h(x) = \frac{9x^2 - 1}{x^3 - 2}$$

$$h'(x) = \frac{(x^3-2)(18x) - (9x^2-1)(3x^2)}{(x^3-2)^2}$$

$$= \frac{18x^4 - 36x - 27x^4 + 3x^2}{(x^3-2)^2}$$

$$= \boxed{\frac{-9x^4 + 3x^2 - 36x}{(x^3-2)^2}}$$

(or factor out 3x from num.)

2. Given $f(x) = g(x) \bullet h(x)$ and $g(3) = 26$; $g'(3) = 7$; $h(3) = 5$; $h'(3) = 2$, find $f'(3)$. Use appropriate mathematical notation.

$$f'(x) = gh' + hg'$$

$$f'(3) = 26(2) + 5(7)$$

$$= 52 + 35 = \boxed{87}$$

Math 125 GQ P and Q Rules(7.6)...

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1. Use the Quotient Rule to find the derivative of the function. Be sure you simplify as far as possible. This means you need to multiply and simplify all of your Quotient Rule numerator results. Do not expand the denominator. Use appropriate mathematical notation.

$$h(x) = \frac{7x^3 - 1}{x^4 - 2}$$

$$h'(x) = \frac{(x^4-2)(21x^2) - (7x^3-1)(4x^3)}{(x^4-2)^2}$$

$$= \frac{21x^6 - 42x^2 - 28x^6 + 4x^3}{(x^4-2)^2}$$

$$= \boxed{\frac{-7x^6 + 4x^3 - 42x^2}{(x^4-2)^2}}$$

or factor out x^2

2. Given $f(x) = g(x) \bullet h(x)$ and $g(3) = 26$; $g'(3) = 7$; $h(3) = 5$; $h'(3) = 2$, find $f'(3)$. Use appropriate mathematical notation.

$$f' = gh' + hg'$$

$$f'(3) = g(3)h'(3) + h(3)g'(3)$$

$$= 26(2) + 5(7)$$

$$= 52 + 35 = 87$$

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1. Use the Quotient Rule to find the derivative of the function. Be sure you simplify as far as possible. This means you need to multiply and simplify all of your Quotient Rule numerator results. Do not expand the denominator. Use appropriate mathematical notation.

$$h(x) = \frac{4x^3 - 1}{x^2 - 2}$$

$$h' = \frac{(x^2-2)(12x^2) - (4x^3-1)(2x)}{(x^2-2)^2}$$

$$= \frac{12x^4 - 24x^2 - 8x^4 + 2x}{(x^2-2)^2}$$

$$= \frac{4x^4 - 24x^2 + 2x}{(x^2-2)^2}$$ or factor out 2X

2. Given $f(x) = g(x) \bullet h(x)$ and $g(3) = 5$; $g'(3) = 2$; $h(3) = 26$; $h'(3) = 7$, find $f'(3)$. Use appropriate mathematical notation.

See Qa.

87

$f'(3) = 5(7) + 26(2) = 87$

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1. Use the Quotient Rule to find the derivative of the function. Be sure you simplify as far as possible. This means you need to multiply and simplify all of your Quotient Rule numerator results. Do not expand the denominator. Use appropriate mathematical notation.

$$h(x) = \frac{8x^4 - 1}{x^3 - 2}$$

$$h' = \frac{(x^3-2)(32x^3) - (8x^4-1)(3x^2)}{(x^3-2)^2}$$

$$= \frac{32x^6 - 64x^3 - 24x^6 + 3x^2}{(x^3-2)^2}$$

$$= \boxed{\frac{8x^6 - 64x^3 + 3x^2}{(x^3-2)^2}}$$

OK factored out x^2

2. Given $f(x) = g(x) \bullet h(x)$ and $g(3) = 5$; $g'(3) = 2$; $h(3) = 26$; $h'(3) = 7$, find $f'(3)$. Use appropriate mathematical notation.

see Q d

$$f'(3) = 5(7) + 26(2) = 87$$