2.3 Product/Quotient Rule and Higher Order Derivatives

Wu: Multiply and then find the derivative.

1) $f(x) = 4x^2(3x+5)$

$f(x) = 12x^3 + 20x^2$

$f'(x) = 36x^2 + 40x$

2) $f(x) = (3x-2)(x+6)$

$f(x) = 3x^2 + 16x - 12$

$f'(x) = 6x + 16$

Product Rule:

$$\frac{d}{dx}[f(x)\cdot g(x)] = f(x)g'(x) + g(x)f'(x)$$

wu 1) $f(x) = \overset{f(x)}{4x^2}\overset{g(x)}{(3x+5)}$

$f'(x) = 4x^2(3) + (3x+5)(8x)$

$f'(x) = 12x^2 + 24x^2 + 40x$

$f'(x) = 36x^2 + 40x$

wu 2) $f(x) = \underset{f(x)}{(3x-2)}\underset{g(x)}{(x+6)}$

$f'(x) = (3x-2)(1) + (x+6)(3)$

$f'(x) = 3x - 2 + 3x + 18$

$f'(x) = 6x + 16$

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