Product Rule and Quotient Rule

Product Rule

If $P(x) = f(x) \bullet g(x)$ then $P'(x) = f'(x) \bullet g(x) + f(x) \bullet g'(x)$

Directions: Find the derivative of each.

1. $f(x) = \left(x^2 + 1\right)\left(2x + 3\right)$

By Product Rule

By FOIL Method

2. Let $f(x) = x^4 \bullet g(x)$. If $g(2) = 3$ and $g'(2) = 5$, then find $f'(2)$.

Quotient Rule

If $Q(x) = \dfrac{f(x)}{g(x)}$ then $Q'(x) = \dfrac{f'(x) \bullet g(x) - f(x) \bullet g'(x)}{\left[g(x)\right]^2}$

Directions: Find the derivative of each.

1. $f(x) = \dfrac{6x+1}{3x-2}$

2. $f(x) = \dfrac{3x-5}{x^2+7}$