WARM UP EXERCISE

The total sales of a company (in millions of dollars) t months from now are given by

 $S(t) = 0.015t^4 + 0.4t^3 + 3.4t^2 + 10t - 3$

Find S ' (t). Find S (4) and S ' (4). Write a brief verbal interpretation of these results.

§11.3 Derivates of Products and Quotients

1

2

The student will learn about:

•the derivative of a product of two functions

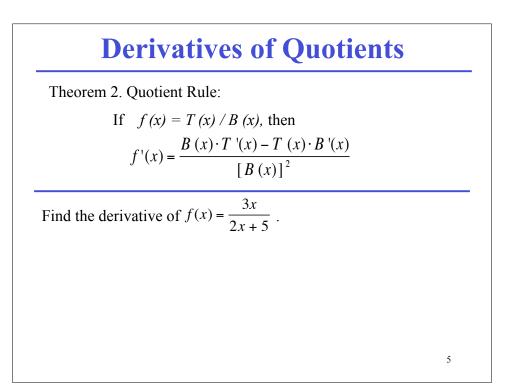
•the derivative of a quotient of two functions.

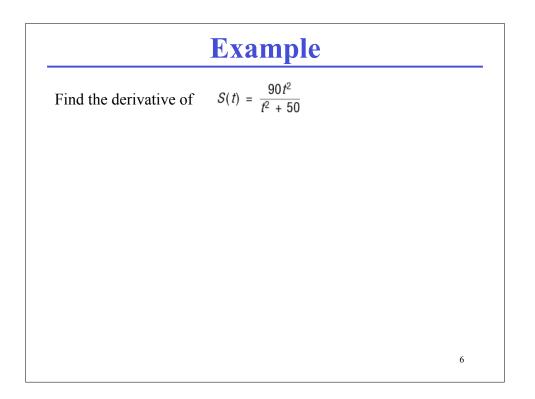
Derivates of Products

Theorem 1 - Product Rule If $f(x) = F(x) \cdot S(x)$, Then $f'(x) = F(x) \cdot S'(x) + S(x) \cdot F'(x)$, $f'(x) = F \frac{dS}{dx} + S \frac{dF}{dx}$ Find the derivative of $y = 5x^2(x^3 + 2)$.

Example Find the derivative of $y = 5x^{1/2}(3x^2-5x)$.

3





Application

Total sales S in thousands of CD's for a CD company are given by $S(t) = (90t^2)/(t^2+50)$

where t is the number of months since the release of the CD. We saw that $S'(t)=(9000t^2)/(t^2+50)^2$.

1. Find S(10) and S'(10).

2. Estimate total sales after 11 months.

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