

Basic Derivative Rules

2.3A – Product Rule

A: Use the Product Rule and Newton's Notation to find the derivative of each product.

#1) $f(x) = x^5 \cdot x^7$

#2) $f(x) = x^5(x^3 - 1)$

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

#4) $f(x) = x(5x^4 - 10)$

#5) $f(x) = (x^2 + 1)(x^2 - 1)$

#6) $f(x) = (x^5 - 1)(x^2 + 1)$

B: Use the Product Rule and Leibniz's Notation to find the derivative of each product.

#7) $f(x) = (x^2 + 2x)(7x + 4)$

#8) $f(x) = x^{11}(x^2 - 5x + 11)$

#9) $f(x) = (\sqrt{x} - 1)(\sqrt{x} + 1)$

#10) $f(x) = (x^{1/3} - x^{1/5})(x^{1/3} + x^{1/5})$

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2.3A – Product Rule

Use the product rule and Leibniz.

#11) $f(x) = (x^4 + x^2 + 9)(x^3 - x)$

Use the product rule and Leibniz.

#12) $f(x) = (\sqrt{x} + 7)(\sqrt{x} + x^2)$

Flag Football

#13) After playing flag football for x hours, a person's body temperature is $T(x) = x^3(2x - 5) + 98.6$ degrees Fahrenheit (for $0 \leq x \leq 3$). Find the rate of change after 2 hours.

iTunes Sales

#14) After x weeks, weekly sales of a song on iTunes are expected to be $S(x) = 3x^2(10 - x^3)$ thousand for the first 2 weeks. Find the rate of change of sales after 2 weeks.