

Basic Derivative Rules

Chapter 2 Review II

Optional

#1) Find the equation for the tangent line to the curve $f(x) = 3x^2 - 2x + 4$ at $x = 1$. Write the answer in slope-intercept form.

#3) If $f(p) = \frac{10}{p} - 9\sqrt[3]{p^5} + 17$ find $\frac{df}{dp}$

#4) If $f(x) = \frac{54}{\sqrt{x}} + 12\sqrt{x}$ find $\frac{df}{dx}\bigg|_{x=9}$

#2) The temperature of a patient in a hospital on day x of an illness is given by in $T(x) = -x^2 + 5x + 100$ degrees Fahrenheit (for $1 < x < 5$).

- Find $T'(x)$
- Use your answer from part (a) to find the instantaneous rate of change of temperature on day 3
- Interpret your answer from part (b)

#5) Why is the derivative referred to as an “instantaneous” rate of change rather than just an “average” rate of change?

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#6) George finds the total points chips he can eat after finishing a gallon of milk is $P(x) = 0.02x^{3/2} + 3000$ chips, where x is the seconds after drinking the milk.

- a. Find $P'(x)$.
- b. Find $P'(10,000)$.
- c. Interpret your answer from (b)

#8) Differentiate $f(x) = \frac{x^5 + x^3 + x}{x^3 + x}$

#9) Differentiate $f(x) = x \ln x - x$

#10) Differentiate $f(x) = e^x + x^e$

#7) Differentiate $f(t) = 6t^{4/3}(3t^{2/3} + 1)$