

LECTURE 15: PRACTICE PROBLEMS

(1) Compute $\frac{d}{dx} [\sqrt[4]{1 + 2x + x^3}]$.

(2) Compute $\frac{d}{dx} [\sin(\tan\sqrt{\sin(x)})]$.

(3) Compute $\frac{d}{dx} \left[\sqrt[3]{1 + \tan(x)} \right]$.

(4) Compute $\frac{d}{dx} \left[\frac{x}{\sqrt{x^2 + 1}} \right]$.

(5) Compute $\frac{d}{dx} [(x^2 - x + 1)^3]$.

(6) Compute $\frac{d}{dx} [\tan^2(3x)]$.

(7) Compute $\frac{d}{dx} \left[\left(\frac{x^2}{x+1} \right)^5 \right]$.

(8) Compute the equation of the line tangent to $y = (x^2 - x + 1)^3$ at $(1, 1)$.

(9) Using the chain rule and $\frac{d}{dx} [x^3] = 3x^2$ and $\frac{d}{dx} [x] = 1$, compute $\frac{d}{dx} [\sqrt[3]{x}]$. (Hint: Use the equation $(\sqrt[3]{x})^3 = x$ and repeat the argument you saw in class today.)