

Chain Rule--Day 2

Questions and More Examples

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$$f(x) = \frac{8}{\sqrt{4+3x}} \quad @ (4,2).$$

$$= 8(4+3x)^{-1/2}$$

$$f'(x) = -4(4+3x)^{-3/2}(3)$$

$$= -\frac{12}{\sqrt{(4+3x)^3}}$$

$$f'(4) = -\frac{12}{64} = -\frac{3}{16} \rightarrow m_T = -\frac{3}{16}$$

$$\therefore y-2 = -\frac{3}{16}(x-4).$$

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

$$f'(x) = \frac{\frac{1}{2\sqrt{x}}}{2\sqrt{1+\sqrt{x}}}$$

OR

$$f'(x) = \frac{1}{2\sqrt{1+\sqrt{x}}} \cdot \frac{1}{2\sqrt{1+\sqrt{x}}} \cdot \frac{1}{2\sqrt{x}}$$

$$h(x) = \sin^2(\cos(\sec x))$$

$$h'(x) = \left[\underline{2 \sin(\cos(\sec x))} \right] \left[\underline{\cos(\cos(\sec x))} \right] \left[\underline{-\sin(\sec x)} \right] \left[\underline{\sec x + \tan x} \right]$$

$$f(x) = \cos^3 \theta^2$$

$$f'(x) = \left[3 \cos^2 \theta^2 \right] \left[-\sin \theta^2 \right] 2\theta$$

$$h(x) = \frac{\sin^2 x^3}{x^2}$$

$$h'(x) = \frac{(x^2)[2\sin x^3 \cos x^3](3x^2) - (\sin^2 x^3)(2x)}{(x^2)^2}$$

$$f(x) = \sqrt[4]{\frac{x^2+1}{x^3+1}}$$

$$f'(x) = \frac{\frac{(x^3+1)(2x) - (x^2+1)(3x^2)}{(x^3+1)^2}}{4 \sqrt[4]{\left(\frac{x^2+1}{x^3+1}\right)^3}}$$

$$g(x) = \sin\left(\frac{x}{\sqrt{x+1}}\right)$$

$$g'(x) = \left[\cos\left(\frac{x}{\sqrt{x+1}}\right)\right] \left[\frac{\sqrt{x+1} - x \frac{1}{2\sqrt{x+1}}}{x+1}\right]$$