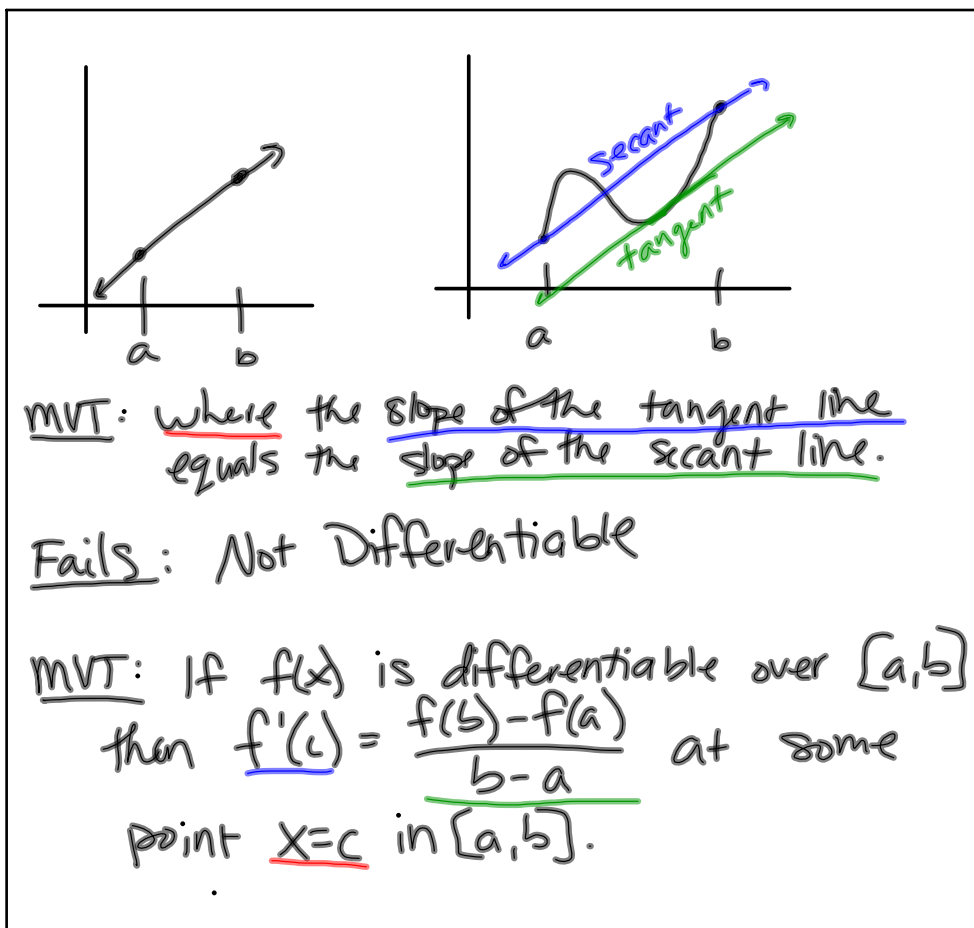


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$$1. f(x) = x^2 \quad [-1, 2]$$

$$\text{Slope of secant: } \frac{f(2) - f(-1)}{2 - (-1)} = \frac{4 - 1}{3} = 1$$

$$f'(x) = 2x$$

$$2x = 1$$

$$x = \frac{1}{2}$$

$$2. y = e^x \quad [0, 2]$$

$$\frac{f(2) - f(0)}{2 - 0} = \frac{e^2 - e^0}{2} = \frac{e^2 - 1}{2}$$

$$y' = \ln e = 1$$

$$= \ln \frac{e^2 - 1}{2}$$

$$x = \ln \left( \frac{e^2 - 1}{2} \right)$$

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$$3. f(x) = \sin x \quad \left[0, \frac{\pi}{2}\right]$$

$$\frac{\sin \frac{\pi}{2} - \sin 0}{\frac{\pi}{2} - 0} = \frac{1}{\frac{\pi}{2}} = \frac{2}{\pi}$$

$$f'(x) = \cos x = \cos^{-1} \frac{2}{\pi}$$

$$x = \cos^{-1} \left( \frac{2}{\pi} \right)$$

$$4. y = x^{\frac{2}{3}} \quad [-1, 1]$$

cusp @  $x = 0$ 

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$$5. y = \sin^{-1} x \quad [-1, 1]$$

$$\frac{\sin^{-1} 1 - \sin^{-1}(-1)}{1 + 1} = \frac{\frac{\pi}{2} - (-\frac{\pi}{2})}{2} = \frac{\pi}{2}$$

$$y' = \frac{1}{\sqrt{1-x^2}} = \frac{\pi}{2}$$

$$\sqrt{1-x^2} = \left(\frac{2}{\pi}\right)^2$$

$$1 - x^2 = \frac{4}{\pi^2} - 1$$

$$\frac{-x^2}{-1} = \frac{\frac{4}{\pi^2} - 1}{-1}$$

$$\sqrt{x^2} = \sqrt{1 - \frac{4}{\pi^2}}$$

$$x = \sqrt{1 - \frac{4}{\pi^2}}$$

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$$9. y = \frac{1}{2x^2} = (2x^2)^{-1} \quad [1, 3]$$

$$\frac{f(3) - f(1)}{3 - 1} = \frac{\frac{1}{18} - \frac{1}{2}}{2} = \frac{-\frac{8}{18} \cdot \frac{1}{2}}{2} = \frac{-\frac{8}{36}}{2} = \frac{-2}{9}$$

$$y' = -1(2x^2)^{-2} (4x) = \frac{-4x}{4x^4} = \frac{-1}{x^3}$$

$$\frac{-1}{x^3} = -\frac{2}{9}$$

$$\frac{-2x^3}{-2} = \frac{-9}{-2}$$

$$x^3 = \frac{9}{2}$$

$$x = \sqrt[3]{\frac{9}{2}}$$

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