

Rates of Change in Trigonometric Functions

$$\text{Average Rate of Change} \Rightarrow m_{\text{secant}} = \frac{f(x_2) - f(x_1)}{x_2 - x_1}$$

$$\text{Estimate of Instantaneous Rate of Change} \Rightarrow m_{\text{secant}} = \frac{f(a+h) - f(a)}{h}$$

Notes:

- (1) Tangent, and all of the reciprocal functions, have a denominator, so beware of vertical asymptotes. It is not possible to determine rate of change at or across a VA.

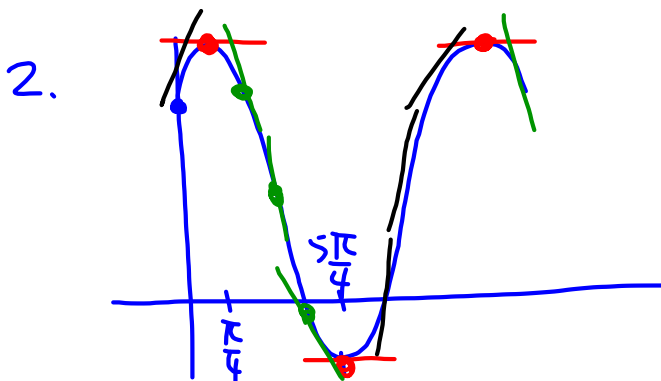
Oct 17-8:44 AM

Assigned Work:

p.369 # 1 - 3, 4bd, 6, 7, 8, 12, 15
2

Review:

p.376 # 1-4, 6, 7, 10, 11bd, 12, 14-17, 19



May 22-8:28 AM

$$7. (a) f(x) = 6 \cos(3x) + 2$$

$$\frac{\pi}{4} \leq x \leq \pi$$

\uparrow a \uparrow b

$$m_{\text{sec}} = \frac{f(b) - f(a)}{b - a}$$

$$= \frac{f(\pi) - f(\frac{\pi}{4})}{\pi - \frac{\pi}{4}}$$

$$=$$

$$f(\pi) = 6 \cos(3\pi) + 2$$

$$= -4$$

$$f(\frac{\pi}{4}) = 6 \cos(\frac{3\pi}{4}) + 2$$

$$= 6 \left(\frac{-\sqrt{2}}{2} \right) + 2$$

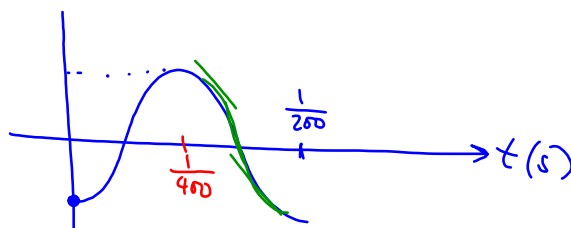
$$= -3\sqrt{2} + 2$$

Nov 7-10:30 AM

$$8. 200 \text{ rps}$$

$$200 \frac{\text{rev}}{\text{sec}} \rightarrow \frac{1}{200} \frac{\text{sec}}{\text{rev}}$$

$$T = \frac{1}{200} \text{ s}$$



$\frac{1}{300}$ on interval $(\frac{1}{400}, \frac{1}{200})$
 \Rightarrow negative slope

\therefore iRoC is negative at $t = \frac{1}{300} \text{ sec}$

Nov 7-10:34 AM