Calc 12 - Chp 3 Review/Ref Sheet

Note Title 2013-09-23

Definition of Derivative: (slope)

$$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$ function

$$f'(a) = \lim_{x \to a} \frac{f(x) - f(a)}{x - a}$$ at an input value

Derivative D.N.E. if there is a discontinuity, corner, or vertical tangent.

Derivative Rules:

$$\frac{d}{dx} c = 0 \qquad \frac{d}{dx}(cx) = c \qquad \frac{d}{dx}(x^n) = n x^{n-1}$$

$$\frac{d}{dx}(u \pm v) = u' \pm v' \qquad \frac{d}{dx}(uv) = uv' + u'v$$

$$\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{u'v - uv'}{v^2}$$

$$\frac{d}{dx}(\sin x) = \cos x$$

$$\frac{d}{dx}(\cos x) = -\sin x \qquad \frac{d}{dx}(\tan x) = \sec^2 x$$

$$\frac{d}{dx}(\csc x) = -(\csc x)(\cot x) \qquad \frac{d}{dx}(\sec x) = (\sec x)(\tan x)$$

$$\frac{d}{dx}(\cot x) = -\csc^2 x$$

Gravity - $32\ ft/s^2$ or $9.8\ m/s^2$

Motion - $s(x)$ = displacement

$v(x) = s'(x)$ = velocity

$a(x) = v'(x) = s''(x)$ = acceleration

$j(x) = a'(x) = v''(x) = s'''(x)$ = jerk.