CALC 103

TEST 1 FORMULA SHEET

Limits:

$$\lim_{x\to a} C = C, \qquad \lim_{x\to\infty} \frac{1}{x} = 0, \qquad \lim_{x\to\infty} x = \infty$$

Derivatives:

$$*\frac{d}{dx}(C) = 0 \quad C = \text{constant}$$

$$*\frac{d}{dx}[kx + C\ ] = k \quad k \text{ and } C \text{ are constants}$$

$$*\frac{d}{dx}(cx^n) = cnx^{n-1}$$ Power of x Rule

$$*\frac{d}{dx}(cu^n) = cnu^{n-1}\ \frac{du}{dx} = cnu^{n-1}\cdot u'$$ Power of a Function of x Rule

$$*\frac{d}{dx}(u + v) = \frac{du}{dx} + \frac{dv}{dx} = u' + v'$$ Sum Rule

$$*\frac{dy}{dx} = \frac{dy}{du}\cdot\frac{du}{dx}$$ Chain Rule

$$*\frac{d}{dx}(uv) = u\frac{dv}{dx} + v\frac{du}{dx} = uv' + vu'$$ Product Rule

$$*\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{v\frac{du}{dx} - u\frac{dv}{dx}}{v^2} = \frac{vu' - uv'}{v^2}$$ Quotient Rule

* Velocity $v = \frac{ds}{dt} = s'$ where s is a displacement function.

* Acceleration $a = \frac{dv}{dt} = \frac{d^2s}{dt^2} = s''$

Differential:

$$dy = f'(x)\,dx$$