

Extra Review for the final exam

< Derivative formula >

- (1) $(x^n)' = nx^{n-1}$
- (2) $(e^x)' = e^x$
- (3) $(a^x)' = a^x \cdot \ln a$
- (4) $(\ln x)' = \frac{1}{x}$
- (5) $(\sin x)' = \cos x$
- (6) $(\cos x)' = -\sin x$
- (7) $(e^{kx})' = k \cdot e^{kx}$
- (8) Go over Chain Rule,
& Product Rule

< Antiderivative formula >

- (1) $\int x^n dx = \frac{x^{n+1}}{n+1} + C$, if $n \neq -1$
- (2) $\int e^x dx = e^x + C$
- (3) $\int e^{kx} dx = \frac{e^{kx}}{k} + C$
- (4) $\int \frac{1}{x} dx = \ln|x| + C$
- (5) $\int a^x dx = \frac{a^x}{\ln a} + C$
- (6) $\int \sin x dx = -\cos x + C$
- (7) $\int \cos x dx = \sin x + C$

< Some values >

- $e^0 = 1$, $a^0 = 1$ for any constant a ,
- $\ln 1 = 0$, $(\ln 0 = -\infty)$, $\ln e = 1$
- $e^\infty = \infty$, $\ln \infty = \infty$.
- $\sin 0 = \cos \frac{\pi}{2} = 0 = \sin \pi = \cos \frac{3\pi}{2}$
- $\sin \frac{\pi}{2} = \cos 0 = 1$
- $\sin \frac{3\pi}{2} = \cos \pi = -1$

< Exponential Properties >

- (1) $a^{x+y} = a^x \cdot a^y$
- (2) $a^{x-y} = \frac{a^x}{a^y}$
- (3) $(a^x)^y = a^{xy}$

< Log properties >

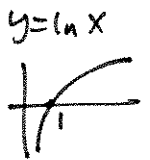
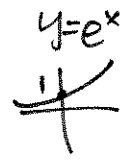
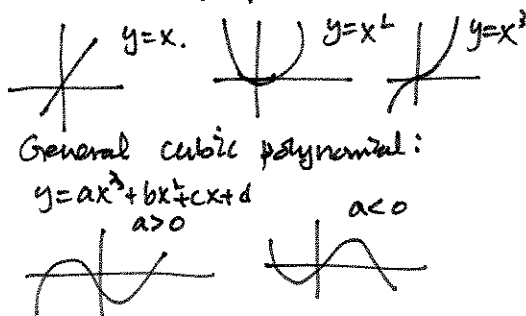
- (1) $\ln(xy) = \ln x + \ln y$
- (2) $\ln\left(\frac{x}{y}\right) = \ln x - \ln y$
- (3) $\ln e^x = x$
- (4) $e^{\ln x} = x$

< Linear equations >

1. Slope = m & point = (x_1, y_1) ,
 $\Rightarrow y - y_1 = m(x - x_1)$
2. Slope = m & y -intercept = b
 $\Rightarrow y = mx + b$

Go over the definitions of critical points, inflection points & 1st/2nd derivative tests to determine inc/dec properties & concavity of a fn.
local & global max/min...

< Some graphs >



< Infinite series >

Refer the Review problems & hand-outs on 11.2.

< Integration by parts & by substitution >

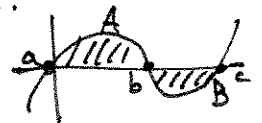
< Exponential growth/decay >

$$P(t) = P_0 \cdot e^{kt}$$

< Differential equations >

< How to find the area under the curve of the function by equation $y=f(x)$ >

Ex:



$$A+B = \int_a^b f(x) dx = \int_b^c f(x) dx$$