Precalc15.6

Use the product rule to find derivatives

Use the quotient rule to find derivatives

Friendly functions:

$y=e^x$ $y' = e^x$

$y=\sin x$ $y' = \cos x$

$y=\cos x$ $y' = -\sin x$

$y=\ln_e|x|$ $y' = \frac{1}{x}$

Quiz 15.5-15.6
Wed. (?)

$y = e^x + \cos x$

$y' = e^x - \sin x$

$y = e^x \cdot \cos x$

Product rule:
1d2 + 2d1 that's the way we get it done!

$y = e^x \cos x$

1 2

d1 d2

e^x $-\sin x$

$y' = e^x \cdot (-\sin x) + (\cos x) e^x$

$= e^x (-\sin x + \cos x)$

Quotient rule:
Angels we have heard on high

1 2

★ $y=x^2(\cos x)$ $\quad x^2(-\sin x)+2x(\cos x)$

d1 d2

2x −sinx

★ $y=e^x(\sin x)$

e^x cosx

$y=(\sin x)(\cos x)$ $= -\sin^2 x + \cos$

cosx −sinx

$\rightarrow y=\sin x/2x^2$ $\quad y=\dfrac{\sin x}{2x^2}$ cosx high / 4x low

$\dfrac{2x^2\cdot\cos x-4x\cdot\sin x}{(2x^2)^2}$

★ $y=e^x/\cos x$

$\dfrac{e^x\cos x+e^x\sin x}{\cos^2 x}$

$\dfrac{e^x\cos x+e^x\sin x}{\cos^2 x}$

$\dfrac{2\cdot x^2\cos x-4x\sin x}{4x^4}$

$\dfrac{2x(x\cos x-2\sin x)}{2\cdot 2\cdot x\cdot x\cdot x}$

Quotient rule

$$\frac{\text{low} \cdot d\,\text{high} - \text{high} \cdot d\,\text{low}}{(\text{denom})^2}$$

$\frac{e^x}{\cos x}$ $\begin{matrix} e^x \text{ (high)} \\ \cos x \text{ (lower)} \\ -\sin x \end{matrix}$

$$\frac{\cos x \cdot e^x - e^x \cdot -\sin x}{(\cos x)^2}$$

$$\frac{e^x \cos x + e^x \sin x}{\cos^2 x}$$