

Math 124 Review

Autumn 2012

1 Derivatives You Need To Know

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| 1). $\frac{d}{dx}e^x = e^x$ | 7). $\frac{d}{dx}\sec(x) = \sec(x)\tan(x)$ |
| 2). $\frac{d}{dx}\ln x = \frac{1}{x}$ | 8). $\frac{d}{dx}\cot(x) = -\csc^2(x)$ |
| 3). $\frac{d}{dx}\sin(x) = \cos(x)$ | 9). $\frac{d}{dx}\arcsin(x) = \frac{1}{\sqrt{1-x^2}}$ |
| 4). $\frac{d}{dx}\cos(x) = -\sin(x)$ | 10). $\frac{d}{dx}\arccos(x) = \frac{-1}{\sqrt{1-x^2}}$ |
| 5). $\frac{d}{dx}\tan(x) = \sec^2(x)$ | 11). $\frac{d}{dx}\arctan(x) = \frac{1}{1+x^2}$ |
| 6). $\frac{d}{dx}\csc(x) = -\csc(x)\cot(x)$ | 12). $\frac{d}{dx}a^x = a^x\ln(a)$ |

2 Differentiation Rules

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| 1). Product rule | If have $f(x)g(x)$, then
$(f(x)g(x))' = f'(x)g(x) + g'(x)f(x)$ |
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| 2). Quotient rule | If have $\frac{f(x)}{g(x)}$, then
$\left(\frac{f(x)}{g(x)}\right)' = \frac{f'(x)g(x) - g'(x)f(x)}{(g(x))^2}$ |
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| 3). Chain Rule | If you have $f(g(x))$, then
$(f(g(x)))' = f'(g(x))g'(x)$. |
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Practice these with the **Derivatives Game Sheet**

3 Trig. Identities

Note that these are not as important, but you will need to know these later on in the quarter.

1. Fundamental Identities $\sin^2(x) + \cos^2(x) = 1$
 $1 + \tan^2(x) = \sec^2(x)$

2. Double Angle Formulas $\sin(2x) = 2 \sin(x) \cos(x)$
 $\cos(2x) = \cos^2(x) - \sin^2(x) = 2 \cos^2(x) - 1 = 1 - 2 \sin^2(x)$

3. Half-Angle Formulas $\sin^2(x) = \frac{1 - \cos(2x)}{2}$
 $\cos^2(x) = \frac{1 + \cos(2x)}{2}$