HW: Rules of Differentiation- Exponential Functions
By: *Ing Ziad Najjar*

Name: Jasmin Salcedo ID: A01510234 Date: 28/09/17

Find the derivative of the following functions: **BOX YOUR ANSWER**

If $f(x)=e^U$ then $f'(x)=U'e^U$	If $f(x)=a^U$ then $f'(x)=U'(\ln a)a^U$

1) $f(x)=\sqrt{2x+e^{10x}}$

$f'(x)=(2x+e^{10x})^{1/2}$

$f'(x)=1/2(2x+e^{10x})^{-1/2}(2+10e^{10x})$

$f'(x)=\dfrac{(2+10e^{10x})}{2\sqrt{2x+e^{10x}}}$

2) $f(x)=4e^{\frac{x}{2}}+\dfrac{5}{2x^2}$

$f'(x)=4e^{x/2}+5x^{-2}$

$f'(x)=4(1/2e^{x/2})-5x^{-3}$

$f'(x)=2e^{x/2}-5/x^3$

3) $f(x)=\dfrac{2x^3}{e^{2x}}$

$f'(x)=\dfrac{e^{2x}(6x^2-2x^3(2e^{2x})}{(e^{2x})^2}$

$f'(x)=2x^2(e^{2x})[3-2x]/e^{4x}$

$f'(x)=6e^{2x}x^2-4e^{2x}x^3/e^{2x}$

4) $y=x^4(e^{1-2x})$ $u'=4x^3$ $v'=-2e^{1-2x}$

$y'=x^4(-2e^{1-2x})+e^{1-2x}(4x^3)$

$y=x^3(e^{1-2x})[x(-2)+4]$

$y'=x^3(e^{1-2x})(-2x+4)$

$y'=-2x^4e^{1-2x}+4x^3e^{1-2x}$

5) $y=\dfrac{3}{e^{2x^2}}$ $u=3$ $u'=0$ $v=e^{2x^2}$ $v'=4xe^{2x^2}$

$y'=\dfrac{(e^{2x^2})(0)-3(4e^{2x^2})}{(e^{2x^2})^2}$

$y'=\dfrac{-12xe^{4x^2}}{(e^{2x^2})^2}$ $y'=\dfrac{-12x}{e^{2x^2}}$

6) $y=\dfrac{e^{x^2}}{2x}$

$y'=e^{x^2}(2x^{-1})$

$y'=e^{x^2}(-2x^{-2})+2x(2xe^{x^2})$

$y'=2x(e^{x^2})[-x^{-3}+2]$

$y'=-2x^{-2}e^{x^2}+4xe^{x^2}$

$y'=e^{x^2}[2x^{-2}+4]/2x^2$

7) $y=e^{3x}(2x-1)^4$

$y'=e^{3x}[8(2x-1)^3]+(2x-1)^4(3e^{3x})$

$y'=8e^{3x}(2x-1)^3+3e^{3x}(2x-1)^4$

$y'=e^{3x}(2x-1)^3[8+3(2x-1)]$

$y'=e^{3x}(6x+5)(2x-1)^3$

8) $f(x)=\dfrac{e^{2x}}{6}+2x^5$

$f'(x)=\dfrac{6(2e^{2x})-e^{2x}(0)+10x^4}{36}$

$f'(x)=\dfrac{12e^{2x}}{36}+10x^4$

$f'(x)=1/3e^{2x}+10x^4$