Mathematics 122

Quiz #21 Name: Key

You must show your work to get full credit.

These first problems are just to see if you have learned the dertivatives of the basic functions.

Let a, b, c, k be constansts. Compute the following derivatives.

1. $y = \ln(x)$. $y' =$ $\frac{1}{x}$

2. $w = e^z$. $\frac{dw}{dz} =$ e^z

3. $y = 5^x$ $y' =$ $5^x \ln(5)$

4. $f(x) = \frac{1}{x^2} + 5\sqrt{x}$. $f'(x) =$ $-2x^{-3} + \frac{5}{2} x^{-\frac{1}{2}}$

$= x^{-2} + 5x^{\frac{1}{2}}$

5. $s(t) = 8\ln(2t+1)$. $s'(t) =$ $8 \frac{1}{2t+1}(2) = \frac{16}{2t+1}$

6. $h(w) = (w^4 - 2w)^5$ $h'(w) =$ $5(w^4-2w)^4(4w^3-2)$

7. $f(t) = 2te^t$ $f'(t) =$ $2e^t + 2te^t = (2+2t)e^t$

$f'(t) = 2e^t + 2te^t$

8. $w(r) = \frac{ar^2}{b+r^3}$ $w'(r) =$ $\frac{2abr - 4ar^4}{(b+r^3)^2}$

$w' = \frac{(ar^2)'(b+r^3) - ar^2(b+r^3)'}{(b+r^3)^2}$

$= \frac{2ar(b+r^3) - ar^2(3r^2)}{(b+r^3)^2} = \frac{2abr + 2ar^4 - 6ar^4}{(b+r^3)^2}$

our have