Mathematics 122

Quiz #19 Name: Key

You must show your work to get full credit.

Compute the following derivatives.

$y = 3x^2e^x + 2\ln(x)$ $\quad y' =$ $(3x^2+6x)e^x + \frac{2}{x}$

$R(q) = \dfrac{q^2}{q^2+q} = \dfrac{q}{q+1}$ $\quad \dfrac{q+1-q}{(q+1)^2}$ $\quad \dfrac{dR}{dq} = \dfrac{1}{(q+1)^2} = \dfrac{q^2}{(q^2+q)^2}$

$\dfrac{2q(q^2+q) - q^2(2q+1)}{(q^2+q)^2} = \dfrac{q^2}{(q^2+q)^2}$

$w = z\ln(z) - z$ $\quad \dfrac{dw}{dz} =$ $\ln(z)$

$w' = z'\ln(z) + z\ln(z)' - 1$

$= 1\ln(z) + z\left(\frac{1}{z}\right) - 1$

$= \ln(z) + 1 - 1$

$= \ln(z)$