Mathematics 122

Quiz 11 Name: Key

You must show your work to get full credit.

Find the derivatives of the following functions.

1. $y = 5$ $y' =$ 0

2. $f(q) = q^3 + 13$ $f'(q) =$ $3q^2$

3. $y = \sqrt{x} = x^{\frac{1}{2}}$ $\frac{dy}{dx} =$ $\frac{1}{2}x^{-\frac{1}{2}} = \frac{1}{2\sqrt{x}}$

$y' = \frac{1}{2}x^{\frac{1}{2}-1} = \frac{1}{2}x^{-\frac{1}{2}} = \frac{1}{2\sqrt{x}}$

4. $y = z^2 + \frac{1}{2z} = z^2 + \frac{1}{2}z^{-1}$ $\frac{dy}{dz} =$ $2z - 2z^{-2} = 2z - \frac{2}{z^2}$

$y' = 2z + (-1)\frac{1}{2}z^{-2}$

$= 2z - 2z^{-2}$

$= 2z - \frac{2}{z^2}$

5. $v = at^2 + \frac{b}{t^2}$ where a and b are constants. $\frac{dv}{dt} =$ $2at^2 - 2bt^{-3}$ $= 2at^2 - \frac{2b}{t^3}$

$v = at^2 + bt^{-2}$

$\frac{dv}{dt} = 2at^2 - 2bt^{-3}$