3. Which of the following are correct calculations for difference quotient of:
$y(q) = 4q^2 + 4q + 9$

$y(q) = 4q^2 + 4q + 9$

$y(q+h) = 4(h+q)^2 + 4(h+q) + 9$

$= 4h^2 + 8hq + 4h + 4q^2 + 4q + 9$

$\dfrac{y(q+h) - y(q)}{h} = \dfrac{\left(4h^2 + 8qh + 4h + 4q^2 + 4q + 9\right) - \left(4(q+1)^2 + 4(q+1) + 9\right)}{h}$

$= \dfrac{4h^2 + 8qh + 4h}{h}$

$= \dfrac{h(4h + 8q + 4)}{h}$

$= 4h + 8q + 4$

$y(q) = 4q^2 + 4q + 9$

$y(q+h) = 4(h+q)^2 + 4(h+q) + 9$

$= 4h^2 + 8hq + 12h + 4q^2 + 12q + 17$

$\dfrac{y(q+h) - y(q)}{h} = \dfrac{\left(4h^2 + 8qh + 12h + 4q^2 + 12q + 17\right) - \left(4q^2 + 4q + 9\right)}{h}$

$= \dfrac{4h^2 + 8qh + 4h}{h}$

$= \dfrac{h(4h + 8q + 4)}{h}$

$= 4h + 8q + 4$

$y(q) = 4q^2 + 4q + 9$

$y(q+h) = 4(h+q)^2 + 4(h+q) + 9$

$= 4h^2 + 8hq + 4h + 4q^2 + 4q + 9$

$\dfrac{y(q+h) - y(q)}{h} = \dfrac{\left(4h^2 + 8qh + 4h + 4q^2 + 4q + 9\right) - \left(4q^2 + 4q + 9\right)}{h}$

$= \dfrac{4h^2 + 8qh + 4h}{h}$

$= \dfrac{h(4h + 8q + 4)}{h}$

$= 4h + 8q + 4$

$y(q) = 4q^2 + 4q + 9$

$y(q+h) = 4(h+q)^2 + 4(h+q) + 9$

$= 4h^2 + 8hq - 4h + 4q^2 - 4q + 9$

$\dfrac{y(q+h) - y(q)}{h} = \dfrac{\left(4h^2 + 8qh + 20h + 4q^2 + 20q + 33\right) - \left(4q^2 + 4q + 9\right)}{h}$

$= \dfrac{4h^2 + 8qh + 4h}{h}$

$= \dfrac{h(4h + 8(q+1) + 4)}{h}$

$= 4h + 8q + 4$

Solution