3. Which of the following are correct calculations for difference quotient of:

$f(q) = 3q^2 + 2q + 8$

$f(q) = 3q^2 + 2q + 8$

$f(q+h) = 3(h+q)^2 + 2(h+q) + 8$

$= 3h^2 + 6hq + 2h + 3q^2 + 2q + 8$

$$\frac{f(q+h)-f(q)}{h} = \frac{\left(3h^2+6qh+2h+3q^2+2q+8\right)-\left(3(q+1)^2+2(q+1)+8\right)}{h}$$

$$= \frac{3h^2+6qh+2h}{h}$$

$$= \frac{h(3h+6q+2)}{h}$$

$= 3h + 6q + 2$

$f(q) = 3q^2 + 2q + 8$

$f(q+h) = 3(h+q)^2 + 2(h+q) + 8$

$= 3h^2 + 6hq + 8h + 3q^2 + 8q + 13$

$$\frac{f(q+h)-f(q)}{h} = \frac{\left(3h^2+6qh+8h+3q^2+8q+13\right)-\left(3q^2+2q+8\right)}{h}$$

$$= \frac{3h^2+6qh+2h}{h}$$

$$= \frac{h(3h+6q+2)}{h}$$

$= 3h + 6q + 2$

$f(q) = 3q^2 + 2q + 8$

$f(q+h) = 3(h+q)^2 + 2(h+q) + 8$

$= 3h^2 + 6hq + 2h + 3q^2 + 2q + 8$

$$\frac{f(q+h)-f(q)}{h} = \frac{\left(3h^2+6qh+2h+3q^2+2q+8\right)-\left(3q^2+2q+8\right)}{h}$$

$$= \frac{3h^2+6qh+2h}{h}$$

$$= \frac{h(3h+6q+2)}{h}$$

$= 3h + 6q + 2$

$f(q) = 3q^2 + 2q + 8$

$f(q+h) = 3(h+q)^2 + 2(h+q) + 8$

$= 3h^2 + 6hq - 4h + 3q^2 - 4q + 9$

$$\frac{f(q+h)-f(q)}{h} = \frac{\left(3h^2+6qh+14h+3q^2+14q+24\right)-\left(3q^2+2q+8\right)}{h}$$

$$= \frac{3h^2+6qh+2h}{h}$$

$$= \frac{h(3h+6(q+1)+2)}{h}$$

$= 3h + 6q + 2$

Solution