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

$$x(n) = 9n^2 + 5n + 8$$

$$x(n) = 9n^2 + 5n + 8$$

$$x(n+h) = 9(h+n)^2 + 5(h+n) + 8$$

$$= 9h^2 + 18hn + 5h + 9n^2 + 5n + 8$$

$$\frac{x(n+h) - x(n)}{h} = \frac{\left(9h^2 + 18nh + 5h + 9n^2 + 5n + 8\right) - \left(9(n+1)^2 + 5(n+1) + 8\right)}{h}$$

$$= \frac{9h^2 + 18nh + 5h}{h}$$

$$= \frac{h(9h + 18n + 5)}{h}$$

$$= 9h + 18n + 5$$

$$x(n) = 9n^2 + 5n + 8$$

$$x(n+h) = 9(h+n)^2 + 5(h+n) + 8$$

$$= 9h^2 + 18hn + 23h + 9n^2 + 23n + 22$$

$$\frac{x(n+h) - x(n)}{h} = \frac{\left(9h^2 + 18nh + 23h + 9n^2 + 23n + 22\right) - \left(9n^2 + 5n + 8\right)}{h}$$

$$= \frac{9h^2 + 18nh + 5h}{h}$$

$$= \frac{h(9h + 18n + 5)}{h}$$

$$= 9h + 18n + 5$$

$$x(n) = 9n^2 + 5n + 8$$

$$x(n+h) = 9(h+n)^2 + 5(h+n) + 8$$

$$= 9h^2 + 18hn + 5h + 9n^2 + 5n + 8$$

$$\frac{x(n+h) - x(n)}{h} = \frac{\left(9h^2 + 18nh + 5h + 9n^2 + 5n + 8\right) - \left(9n^2 + 5n + 8\right)}{h}$$

$$= \frac{9h^2 + 18nh + 5h}{h}$$

$$= \frac{h(9h + 18n + 5)}{h}$$

$$= 9h + 18n + 5$$

$$x(n) = 9n^2 + 5n + 8$$

$$x(n+h) = 9(h+n)^2 + 5(h+n) + 8$$

$$= 9h^2 + 18hn - 13h + 9n^2 - 13n + 12$$

$$\frac{x(n+h) - x(n)}{h} = \frac{\left(9h^2 + 18nh + 41h + 9n^2 + 41n + 54\right) - \left(9n^2 + 5n + 8\right)}{h}$$

$$= \frac{9h^2 + 18nh + 5h}{h}$$

$$= \frac{h(9h + 18(n+1) + 5)}{h}$$

$$= 9h + 18n + 5$$

Solution