

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

$$q(u) = 3u^2 + 9u + 9$$

$$q(u) = 3u^2 + 9u + 9$$

$$q(u+h) = 3(h+u)^2 + 9(h+u) + 9$$

$$= 3h^2 + 6hu + 9h + 3u^2 + 9u + 9$$

$$\frac{q(u+h) - q(u)}{h} = \frac{(3h^2 + 6uh + 9h + 3u^2 + 9u + 9) - (3(u+1)^2 + 9(u+1) + 9)}{h}$$

$$= \frac{3h^2 + 6uh + 9h}{h}$$

$$= \frac{h(3h + 6u + 9)}{h}$$

$$= 3h + 6u + 9$$

$$q(u) = 3u^2 + 9u + 9$$

$$q(u+h) = 3(h+u)^2 + 9(h+u) + 9$$

$$= 3h^2 + 6hu + 15h + 3u^2 + 15u + 21$$

$$\frac{q(u+h) - q(u)}{h} = \frac{(3h^2 + 6uh + 15h + 3u^2 + 15u + 21) - (3u^2 + 9u + 9)}{h}$$

$$= \frac{3h^2 + 6uh + 9h}{h}$$

$$= \frac{h(3h + 6u + 9)}{h}$$

$$= 3h + 6u + 9$$

$$q(u) = 3u^2 + 9u + 9$$

$$q(u+h) = 3(h+u)^2 + 9(h+u) + 9$$

$$= 3h^2 + 6hu + 9h + 3u^2 + 9u + 9$$

$$\frac{q(u+h) - q(u)}{h} = \frac{(3h^2 + 6uh + 9h + 3u^2 + 9u + 9) - (3u^2 + 9u + 9)}{h}$$

$$= \frac{3h^2 + 6uh + 9h}{h}$$

$$= \frac{h(3h + 6u + 9)}{h}$$

$$= 3h + 6u + 9$$

$$q(u) = 3u^2 + 9u + 9$$

$$q(u+h) = 3(h+u)^2 + 9(h+u) + 9$$

$$= 3h^2 + 6hu + 3h + 3u^2 + 3u + 3$$

$$\frac{q(u+h) - q(u)}{h} = \frac{(3h^2 + 6uh + 21h + 3u^2 + 21u + 39) - (3u^2 + 9u + 9)}{h}$$

$$= \frac{3h^2 + 6uh + 9h}{h}$$

$$= \frac{h(3h + 6(u+1) + 9)}{h}$$

$$= 3h + 6u + 9$$

Solution