4. Which of the following are correct calculations for difference quotient of: $k\left(e\right)=5\ e^{2}+6\ e+7$

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\begin{array}{l} k\left(e\right) = 5 \,\, e^2 \, + \, 6 \,\, e \, + \, 7 \\ k\left(e + h\right) = 5 \,\, \left(e \, + \, h\right)^2 \, + \, 6 \,\, \left(e \, + \, h\right) \, + \, 7 \\ = 5 \,\, e^2 \, + \, 10 \,\, e \,\, h \, + \, 6 \,\, e \, + \, 5 \,\, h^2 \, + \, 6 \,\, h \, + \, 7 \\ \frac{k\left(e + h\right) - k\left(e\right)}{h} = \frac{\left(5 \,e^2 + 10 \,h \,e + 6 \,e + 5 \,h^2 + 6 \,h + 7\right) - \left(5 \,\left(e + 1\right)^2 + 6 \,\left(e + 1\right) + 7\right)}{h} \\ = \frac{5 \,h^2 + 10 \,e \,h + 6 \,h}{h} \\ = \frac{h\left(10 \,e + 5 \,h + 6\right)}{h} \\ = 10 \,\, e \, + \, 5 \,\, h \, + \, 6 \end{array}
```

$$\begin{array}{l} k\left(e\right) = 5 \,\, e^2 \, + \, 6 \,\, e \, + \, 7 \\ k\left(e + h\right) = 5 \,\, \left(e \, + \, h\right)^2 \, + \, 6 \,\, \left(e \, + \, h\right) \, + \, 7 \\ = 5 \,\, e^2 \, + \, 10 \,\, e \,\, h \, + \, 16 \,\, e \, + \, 5 \,\, h^2 \, + \, 16 \,\, h \, + \, 18 \\ \frac{k\left(e + h\right) - k\left(e\right)}{h} = \frac{\left(5 \,e^2 + 10 \,h \,e + 16 \,e + 5 \,h^2 + 16 \,h + 18\right) - \left(5 \,e^2 + 6 \,e + 7\right)}{h} \\ = \frac{5 \,h^2 + 10 \,e \,h + 6 \,h}{h} \\ = \frac{h\left(10 \,e + 5 \,h + 6\right)}{h} \\ = 10 \,e \, + \, 5 \,h \, + \, 6 \end{array}$$

$$\begin{array}{c} k\left(e\right) = 5 \,\, e^2 \, + \, 6 \,\, e \, + \, 7 \\ k\left(e + h\right) = 5 \,\, \left(e \, + \, h\right)^2 \, + \, 6 \,\, \left(e \, + \, h\right) \, + \, 7 \\ = 5 \,\, e^2 \, + \, 10 \,\, e \,\, h \, + \, 6 \,\, e \, + \, 5 \,\, h^2 \, + \, 6 \,\, h \, + \, 7 \\ \frac{k\left(e + h\right) - k\left(e\right)}{h} = \frac{\left(5 \,e^2 + 10 \,h \,e + 6 \,e + 5 \,h^2 + 6 \,h + 7\right) - \left(5 \,e^2 + 6 \,e + 7\right)}{h} \\ = \frac{5 \,h^2 + 10 \,e \,h + 6 \,h}{h} \\ = \frac{h\left(10 \,e + 5 \,h + 6\right)}{h} \\ = 10 \,\, e \, + \, 5 \,\, h \, + \, 6 \end{array}$$

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\begin{split} k\,(\,e\,) &= 5\,\,e^2\,+\,6\,\,e\,+\,7 \\ k\,(\,e\,+\,h\,) &= 5\,\,\left(\,e\,+\,h\,\right)^{\,2}\,+\,6\,\,\left(\,e\,+\,h\,\right)\,\,+\,7 \\ &= 5\,\,e^2\,+\,10\,\,e\,\,h\,-\,4\,\,e\,+\,5\,\,h^2\,-\,4\,\,h\,+\,6 \\ \frac{k\,(\,e\,+\,h\,)\,-\,k\,(\,e\,)}{h} &= \frac{\left(\,5\,\,e^2\,+\,10\,\,h\,\,e\,+\,26\,\,e\,+\,5\,\,h^2\,+\,26\,\,h\,+\,39\,\right)\,-\,\left(\,5\,\,e^2\,+\,6\,\,e\,+\,7\,\right)}{h} \\ &= \frac{5\,\,h^2\,+\,10\,\,e\,\,h\,+\,6\,\,h}{h} \\ &= \frac{h\,(\,10\,\,(\,e\,+\,1\,)\,+\,5\,\,h\,+\,6\,)}{h} \\ &= 10\,\,e\,+\,5\,\,h\,+\,6 \end{split}
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Solution