1. Which of the following are correct calculations for difference quotient of: $x(w) = 2 w^2 + 3 w + 4$ $x(w) = 2 w^2 + 3 w + 4$ $x(w+h) = 2 (h+w)^2 + 3 (h+w) + 4$

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 \begin{array}{l} x \ (w) = 2 \ w^2 + 3 \ w + 4 \\ x \ (w+h) = 2 \ (h+w)^2 + 3 \ (h+w) + 4 \\ = 2 \ h^2 + 4 \ h \ w + 3 \ h + 2 \ w^2 + 3 \ w + 4 \\ \frac{x \ (w+h) - x \ (w)}{h} = \frac{\left(2 \ h^2 + 4 \ w \ h + 3 \ h + 2 \ w^2 + 3 \ w + 4\right) - \left(2 \ (w+1)^2 + 3 \ (w+1) + 4\right)}{h} \\ = \frac{2 \ h^2 + 4 \ w \ h + 3 \ h}{h} \\ = \frac{h \ (2 \ h + 4 \ w + 3)}{h} \\ = 2 \ h + 4 \ w + 3 \end{array}
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$$\begin{split} x\left(w\right) &= 2\ w^2 + 3\ w + 4 \\ x\left(w + h\right) &= 2\ \left(h + w\right)^2 + 3\ \left(h + w\right) + 4 \\ &= 2\ h^2 + 4\ h\ w + 7\ h + 2\ w^2 + 7\ w + 9 \\ \frac{x\left(w + h\right) - x\left(w\right)}{h} &= \frac{\left(2\ h^2 + 4\ w\ h + 7\ h + 2\ w^2 + 7\ w + 9\right) - \left(2\ w^2 + 3\ w + 4\right)}{h} \\ &= \frac{2\ h^2 + 4\ w\ h + 3\ h}{h} \\ &= \frac{h\left(2\ h + 4\ w + 3\right)}{h} \\ &= 2\ h + 4\ w + 3 \end{split}$$

$$\begin{array}{c} x \ (w) = 2 \ w^2 + 3 \ w + 4 \\ x \ (w+h) = 2 \ (h+w)^2 + 3 \ (h+w) + 4 \\ = 2 \ h^2 + 4 \ h \ w + 3 \ h + 2 \ w^2 + 3 \ w + 4 \\ \frac{x \ (w+h) - x \ (w)}{h} = \frac{\left(2 \ h^2 + 4 \ w \ h + 3 \ h + 2 \ w^2 + 3 \ w + 4\right) - \left(2 \ w^2 + 3 \ w + 4\right)}{h} \\ = \frac{2 \ h^2 + 4 \ w \ h + 3 \ h}{h} \\ = \frac{h \ (2 \ h + 4 \ w + 3)}{h} \\ = 2 \ h + 4 \ w + 3 \\ \end{array}$$

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 \begin{array}{l} x \ (w) = 2 \ w^2 + 3 \ w + 4 \\ x \ (w+h) = 2 \ (h+w)^2 + 3 \ (h+w) + 4 \\ = 2 \ h^2 + 4 \ h \ w - h + 2 \ w^2 - w + 3 \\ \frac{x \ (w+h) - x \ (w)}{h} = \frac{\left(2 \ h^2 + 4 \ w \ h + 11 \ h + 2 \ w^2 + 11 \ w + 18\right) - \left(2 \ w^2 + 3 \ w + 4\right)}{h} \\ = \frac{2 \ h^2 + 4 \ w \ h + 3 \ h}{h} \\ = \frac{h \ (2 \ h + 4 \ w + 1) + 3)}{h} \\ = 2 \ h + 4 \ w + 3 \end{array}
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Solution