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In[1]:= f[x + δx] - f[x - δx];
Series[%, {δx, 0, 7}]
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$$\text{Out[2]= } 2 f'[x] \delta x + \frac{1}{3} f^{(3)}[x] \delta x^3 + \frac{1}{60} f^{(5)}[x] \delta x^5 + \frac{f^{(7)}[x] \delta x^7}{2520} + O[\delta x]^8$$

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In[3]:= (f[x + n δx] - n f[x + δx] + n f[x - δx] - f[x - n δx]) / (n^3 - n);
Series[%, {δx, 0, 7}]
```

$$\text{Out[4]= } \frac{1}{3} f^{(3)}[x] \delta x^3 + \frac{1}{60} (f^{(5)}[x] + n^2 f^{(5)}[x]) \delta x^5 + \frac{(f^{(7)}[x] + n^2 f^{(7)}[x] + n^4 f^{(7)}[x]) \delta x^7}{2520} + O[\delta x]^8$$

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In[5]:= (f[x + n δx] - n f[x + δx] + n f[x - δx] - f[x - n δx]) / (n^3 - n);
Series[% /. n -> 2, {δx, 0, 7}]
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$$\text{Out[6]= } \frac{1}{3} f^{(3)}[x] \delta x^3 + \frac{1}{12} f^{(5)}[x] \delta x^5 + \frac{1}{120} f^{(7)}[x] \delta x^7 + O[\delta x]^8$$