A. $f(a+h) = f(a) + f'(a)\,h + \frac{f''(a)}{2}h^2 + \frac{f'''(a)}{3!}h^3 + O(h^4)$

$f(a-h) = f(a) + f'(a)(-h) + \frac{f''(a)}{2}(-h)^2 + \frac{f'''(a)}{3!}(-h)^3 + O(h^4)$

$f(a+h) - f(a-h) = f'(a)\cdot 2h + \frac{f'''(a)}{3!}2\cdot h^3 + O(h^4)$

$$\frac{f(a+h) - f(a-h)}{2h} = f'(a) + \frac{f'''(a)}{3!}h^2 + O(h^4)$$

Approximation error $= f'(a) + \frac{f'''(a)h^2}{3!} + O(h^4) - f'(a)$

$= \frac{f'''(a)h^2}{3!} + O(h^4) = O(h^2) + O(h^4)$

$= O(h^2)$

B. if $f''(a) = 0$

then Approximation error $= O(h^4)$

the Approximation error is smaller