1996 Paper 2 Question 6(a)

Let $f(x)$ be a function with continuous second order derivative.

a. Prove that

$$\lim_{x \to a} \frac{\int_a^x f(t)dt - \frac{1}{2}(x-a)(f(x) + f(a))}{(x-a)^3} = -\frac{f''(a)}{12}.$$

(3 marks)