

Let $f(x) = x^2 - x$. Compute

$$f(a + h) - f(a)$$

and write it in factored form.

Solution: $f(a + h) = (a + h)^2 - (a + h)$ while $f(a) = a^2 - a$.
Therefore, $f(a + h) - f(a) = (a + h)^2 - (a + h) - (a^2 - a) = a^2 + 2ah + h^2 - a - h - a^2 + a = 2ah + h^2 - h = h(2a + h - 1)$.