3. (14 points) Find the values of the constants $a,\ b$ and c such that the function

$$f(x) = ax^2 + bx + c$$

"fits" the function

$$g(x) = -2\ln(x+1) + 0.5e^x + 1.5\sin(x)$$

near $x = 0$ in the sense that:

$$g(0) = f(0), \quad g'(0) = f'(0) \quad \text{and} \quad g''(0) = f''(0).$$

Show all work.

$a =$ _____

$b =$ _____

$c =$ _____