If $\lim_{x \to \infty} \left(1 + \dfrac{a}{x} + \dfrac{b}{x^2} \right)^{2x} = e^2$, then the values of a and b, are **(2004)**

1) $a \in R,\ b \in R$ 2) $a = 1,\ b \in R$

3) $a \in R,\ b = 2$ 4) $a = 1$ and $b = 2$