36. Assume the Black-Scholes framework. Consider a derivative security of a stock. You are given:

(i) The continuously compounded risk-free interest rate is 0.04.

(ii) The volatility of the stock is σ.

(iii) The stock does not pay dividends.

(iv) The derivative security also does not pay dividends.

(v) $S(t)$ denotes the time-t price of the stock.

(iv) The time-t price of the derivative security is $[S(t)]^{-k/\sigma^2}$, where k is a positive constant.

Find k.

(A) 0.04

(B) 0.05

(C) 0.06

(D) 0.07

(E) 0.08