

## Question #28

Key: C

In general,

$$E(X^2) - E[(X \wedge 150)^2] = \int_0^{200} x^2 f(x) dx - \int_0^{150} x^2 f(x) dx - 150^2 \int_{150}^{200} f(x) dx = \int_{150}^{200} (x^2 - 150^2) f(x) dx.$$

Assuming a uniform distribution, the density function over the interval from 100 to 200 is  $6/7400$  (the probability of  $6/74$  assigned to the interval divided by the width of the interval). The answer is

$$\int_{150}^{200} (x^2 - 150^2) \frac{6}{7400} dx = \left( \frac{x^3}{3} - 150^2 x \right) \frac{6}{7400} \Big|_{150}^{200} = 337.84.$$