Equation in the Nero Wolfe novel

You asked which equation is correct

$$u = \frac{1}{V_{2\pi} \cdot D} \left\{ 1 - \frac{1}{2} k \left(\frac{X}{D} - \frac{1}{3} \frac{X^3}{D^3} \right) \right\} e^{-\frac{1}{2} \frac{X^2}{D^2}}$$

or

$$u = \frac{1}{V_{2\pi} \cdot D} \left\{ 1 - \frac{1}{2} k \left(\frac{X}{D} - \frac{1}{3} \frac{X^3}{D^3} \right) \right\} e^{-\frac{1}{3} \frac{X^3}{D^3}}$$

The simple answer is the first equation is correct. The last exponent should be 2 and the fraction $\frac{1}{2}$.

The more correct answer is that the equation is screwed up. That initial V should be a square root radical.

The Gaussian (normal) distribution was historically called the law of errors. Given μ is the mean and σ is the standard deviation, the equation for a normal distribution is

$$\frac{1}{\sqrt{2\pi}\,\sigma} e^{\frac{-(x-\mu)^2}{2\sigma^2}}$$

Let $\mu = 0$, substitute $\sigma = D$, $x = X$ and you get

$$\frac{1}{\sqrt{2\pi}\,D} e^{-\frac{1}{2} \frac{X^2}{D^2}}$$

insert that middle term within the set brackets and you get

$$\frac{1}{\sqrt{2\pi}\,D} \left\{ 1 - \frac{1}{2} k \left(\frac{X}{D} - \frac{1}{3} \frac{X^3}{D^3} \right) \right\} e^{-\frac{1}{2} \frac{X^2}{D^2}}$$

This looks like what the equation should have been.