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Geometric average in time, continously sampled

created by **Thijs van den Berg**

$$Y_{ave} = (Y - \tfrac{1}{2}\sigma^2)\frac{t+T}{2}$$
$$\sigma_{ave} = \sigma\sqrt{\frac{2t+T}{3T}}$$

The geometric average in time of geometric Brownian motion is lognormal distributed.

These equations express the two parameters of the lognormal distribution as a function of the continuosly sampled geometric average. Averaging starts at "t" and stops at "T".

An application is the Vorst model for Asian options. In this model the arithmetic average of the Asian options is approximated with a geometric average.

Symbol list:

Y	Yield of the underlying
Y_{ave}	Effective yield of the geometric average
σ	Volatility
σ_{ave}	Effective volatility of the geometric average
t	Start of the averaging period
T	End of the averaging period