$$E\left(G_0 e^{t\mu + \sigma B_t}\right) = G_0 e^{t\mu} \underline{E\left(e^{\sigma B_t}\right)}$$

$$\underline{E\left(e^{\sigma B_t}\right)} = \int_{-\infty}^{\infty} e^{\sigma s} \frac{1}{\sqrt{2\pi t}} \exp\left(-\frac{1}{2t} s^2\right) ds$$

$$= \int_{-\infty}^{\infty} \frac{1}{\sqrt{2\pi t}} \exp\left(-\frac{1}{2t} s^2 + \sigma s\right) ds = \int_{-\infty}^{\infty} \frac{1}{\sqrt{2\pi t}} \exp\left(-\frac{1}{2t}(s - t\sigma)^2 + \frac{t\sigma^2}{2}\right) ds$$

$$= e^{t\sigma^2/2} \int_{-\infty}^{\infty} \frac{1}{\sqrt{2\pi t}} \exp\left(-\frac{1}{2t}(s - t\sigma)^2\right) ds = \underline{e^{t\sigma^2/2}}$$

$$\underline{E\left(G_0 e^{t\mu + \sigma B_t}\right) = G_0 e^{t\mu + t\sigma^2/2}}$$

$$Var\left(G_0 e^{t\mu + \sigma B_t}\right) = G_0^2 e^{2t\mu} Var\left(e^{\sigma B_t}\right) = G_0^2 e^{2t\mu}\left(E\left(e^{2\sigma B_t}\right) - E\left(e^{\sigma B_t}\right)^2\right)$$

$$= G_0^2 e^{2t\mu} \_\_\_\_\_\_\_\_$$