

$$\begin{aligned} &> \mathbf{Mx(t)} = \int_0^1 e^{t \cdot x} \cdot 3 \cdot x^2 \, dx \\ &= \frac{3 (e^t t^2 - 2 e^t t + 2 e^t - 2)}{t^3} \end{aligned} \tag{1}$$

Now get  $\mathbf{Mx'(t)}$ .

$$\begin{aligned} &> \text{diff}((1), t) \\ &= \frac{3 e^t}{t} - \frac{9 (e^t t^2 - 2 e^t t + 2 e^t - 2)}{t^4} \end{aligned} \tag{2}$$

Now get the limit as  $\mathbf{t}$  approaches  $\mathbf{0}$  to find the mean.

$$\begin{aligned} &> \text{limit}((2), t=0) \\ &= \frac{3}{4} \end{aligned} \tag{3}$$

Now get  $\mathbf{Mx''(t)}$ .

$$\begin{aligned} &> \text{diff}((2), t) \\ &= \frac{3 e^t}{t} - \frac{12 e^t}{t^2} + \frac{36 (e^t t^2 - 2 e^t t + 2 e^t - 2)}{t^5} \end{aligned} \tag{4}$$

Now get the limit as  $\mathbf{t}$  approaches  $\mathbf{0}$  to find the variance.

$$\begin{aligned} &> \text{limit}((4), t=0) \\ &= \frac{3}{5} \end{aligned} \tag{5}$$

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