← Stochastic integration

Quiz, 6 questions

1 point

1.

Let $I(f)=\int_0^1 t^2 dW_t.$ Find the mean of I(f):

- 1
- \bigcirc 1/2
- 1/4
- none of above

1 point

2

Let $I(f)=\int_0^1 t^2 dW_t.$ Find the variance of I(f):

- 1/2
- none of above
- 1/4
- \bigcirc 5/4

1 point

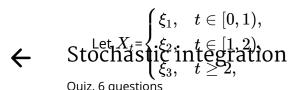
3.

Let N_t be a Poisson process. Find the mean, covariance function and variance of $I(f)=\int_0^t N_s ds$:

- none of above
- $igcap \mathbb{E}\left[I(f)
 ight] = \lambda t$, $Var(I(f)) = (\lambda t)^2$, K(t,s) = 0
- $\mathbb{E}\left[I(f)
 ight] = \lambda t$, $Var(I(f)) = \lambda t$, K(t,s) = 0
- $\mathbb{E}\left[I(f)
 ight] = rac{\lambda t^2}{2} Var(I(f)) = rac{\lambda t^2}{3} K(t,s) = \lambda (rac{t^3}{6} + rac{st^3}{2})$

1 point

4



where ξ_1, ξ_2, ξ_3 - i.i.d. random variables having exponential distribution with parameter λ .

Also let
$$f(t)=egin{cases} 2,&t\in[0,1),\ 5,&t\in[1,2),\ 0,&t\geq2. \end{cases}$$

Find mean and variance of $I(f) = \int_0^T X_t dt$:

$$egin{aligned} igotimes & igotimes & \left[I(f)
ight] = egin{cases} rac{T}{\lambda}, & 1 > T, \ rac{1}{\lambda} + rac{T-1}{\lambda}, & 1 \leq T < 2, \ rac{1}{\lambda} + rac{1}{\lambda} + rac{T-2}{\lambda}, & T \geq 2, \end{cases}$$

$$Var(f(t)) = \begin{cases} \frac{T^2}{\lambda^2}, & 1 > T, \\ \frac{1}{\lambda^2}, & 1 < T, \\ \frac{1}{\lambda^2}, & 1 \leq T < 2, \end{cases}$$

$$\mathbb{E}\left[I(f)\right] = \frac{T}{\lambda}, Var(I(f)) = \frac{T^2}{\lambda^2} \forall T$$
 none of above

$$egin{aligned} \mathbb{E}\left[I(f)
ight] = rac{T}{\lambda^{'}} Var(I(f)) = rac{T^{2}}{\lambda^{2}} orall T \end{aligned}$$

$$\mathbb{E}\left[I(f)
ight] = Var(I(f)) = egin{cases} rac{T}{\lambda}, & 1 > T, \ rac{1}{\lambda}, & T - 1 \ rac{1}{\lambda}, & \lambda, & 1 \leq T < 2, \ rac{1}{\lambda}, & \lambda, & T \geq 2, \end{cases}$$

point

Compute the stochastic integral $\int_0^T W_t^2 dW_t$, where W_t is a Brownian motion:

$$\frac{1}{3}W_T^3$$

$$\bigcirc \quad \frac{1}{2}W_T^2 - \frac{1}{2}T$$

point

6.

Compute the variance of the stochastic integral $\int_0^T W_t dW_t$, where W_t is a Brownian motion:

$$W_T^2$$

$$\frac{T}{2}$$

$$\bigcap T^2$$

I, Mark R. Lytell, understand that submitting work that isn't my own may result in permanent failure of this course or deactivation of my Coursera account.

Stochastic integration Code \leftarrow

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