Wiener Processes
(Finance 4366 Class Problems for 3/26/2020)

1. A variable, x, starts at 10 and follows a generalized Wiener process

$$dx = adt + bdz$$

where $a = 2$, $b = 3$, and dz is a Wiener process.

(i) What is the mean value of the variable after three years?

(ii) What is the standard deviation of the value of the variable after three years?

(iii) What is the mean value of the variable after six months?

(iv) What is the standard deviation of the value of the variable after six months?

2. A variable, x, starts at 10 and follows a generalized Wiener process

$$dx = adt + bdz$$

During the first two years $a = 4$ and $b = 3$. During the following three years $a = 6$ and $b = 4$.

(i) What is the mean value of the variable at the end of the five years?

(ii) What is the standard deviation of the variable at the end of the five years?