

**Wiener Processes**  
**(Finance 4366 Class Problems)**

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

$$dx = a dt + b dz$$

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

$$dx = a dt + b dz$$

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?