

STAT253/317 Winter 2014 Homework 21

Yibi Huang

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1. [IPM10e] Exercise 10.6
2. [IPM10e] Exercise 10.23
3. For standard Brownian motion $\{B(t), t \geq 0\}$ and $a > 0, b > 0$, show that

$$P(B(t) < at + b \text{ for all } t > 0) = 1 - \exp(-2ab)$$

Hint: Define a Brownian motion with drift $-a$ as follows

$$Z(t) = B(t) - at, t \geq 0,$$

and then apply the result in Lecture note 25-2 to $Z(t)$