

2-10. A bullet strikes a resting wooden block at a horizontal speed  $v_1$  and exits the block at speed  $v_2$ .  $v_1$  and  $v_2$  are measured and treated as independent random variables due to the measurement uncertainty and follow normal distributions  $v_1 \sim N(1500, 15^2)$  m/s and  $v_2 \sim N(300, 3^2)$  m/s. The mass of the bullet and the wooden block are  $m_1 = 0.1$  kg and  $m_2 = 10$  kg, respectively. How long will the block slide on the floor, after the bullet emerges, before it comes to rest again? The coefficient of kinetic friction between the block and floor is  $\mu_k = 0.3$ .

**Solution:**  $t \sim N(4.08, 0.052^2)$  s

