1 Textbook:

Section 5.4 (page 92) Problem 1 a - d
Section 5.6 (page 97) 1,2,3.
Section 5.7 (page 103) 1,2.
Section 6.1 (page 113) 1,2,3.

2 Additional problem

1. Verify the following given processes solve the corresponding stochastic differential equations:
   a. \( X_t = e^{B_t} \) solves
      \[ dX_t = \frac{1}{2} X_t dt + X_t dB_t. \]
   b. \( X_t = \frac{B_t}{1 + t} \) solves
      \[ dX_t = -\frac{1}{1 + t} X_t dt + \frac{1}{1 + t} dB_t. \]
   c. \( X_t = \sin(B_t) \) solves
      \[ dX_t = -\frac{1}{2} X_t dt + \sqrt{1 - X_t^2} dB_t. \]