

# 概统作业 (Week 10)

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选  $C$ .

(1)

$$E(Y_1) = \int_{-\infty}^{+\infty} y \cdot \frac{f_1(y) + f_2(y)}{2} dy = \frac{1}{2} \cdot \left( \int_{-\infty}^{+\infty} y \cdot f_1(y) dy + \int_{-\infty}^{+\infty} y \cdot f_2(y) dy \right) = \frac{E(X_1) + E(X_2)}{2}.$$

$$E(Y_2) = E\left(\frac{X_1 + X_2}{2}\right) = \frac{1}{2} \cdot (E(X_1) + E(X_2)) = \frac{E(X_1) + E(X_2)}{2} = E(Y_1).$$

(2)

$$E(Y_1^2) = \int_{-\infty}^{+\infty} y^2 \cdot \frac{f_1(y) + f_2(y)}{2} dy = \frac{1}{2} \cdot \left( \int_{-\infty}^{+\infty} y^2 \cdot f_1(y) dy + \int_{-\infty}^{+\infty} y^2 \cdot f_2(y) dy \right) = \frac{E(X_1^2) + E(X_2^2)}{2}.$$

$$Var(Y_1) = E(Y_1^2) - E(Y_1)^2 = \frac{E(X_1^2) + E(X_2^2)}{2} - \left( \frac{E(X_1) + E(X_2)}{2} \right)^2 =$$

$$Var(Y_2) = Var\left(\frac{X_1 + X_2}{2}\right) = \frac{1}{4} (Var(X_1) + Var(X_2)) =$$

**2**   **(P174 T27)**

**3**   **(P175 T30)**

**4**   **(P175 T32)**

**5**   **(P175 T34)**