

Solutions

Each answer shows the steps, then the **result**.

2.1

- $E(2X + 5) = 2(10) + 5 = 25$

2.2

- $\text{Var}(X + Y) = 4 + 9 = 13$

3.1 B

- $\text{Var}(4X) = 4^2 \times 5 = 80$

3.2

(a)

- mean = $20 - 15 = 5$; variance = $3^2 + 4^2 = 25$; so $X - Y \sim N(5, 25)$

(b)

- $Z = \frac{2 - 5}{5} = -0.6$; $P(X - Y > 2) = P(Z > -0.6) = \Phi(0.6) = 0.7257$

3.3

- total $T = X_1 + X_2 + X_3 + X_4 + B$; mean = $4(500) + 100 = 2100$ g; variance = $4(4^2) + 2^2 = 64 + 4 = 68$, so SD = $\sqrt{68} = 8.25$ g