

HW7Q7

For a R.V. X with $E(X) = 1.2$

& Variance $\text{Var}(X) = 2.8$.

(Its full distribution/W.A is unknown)

Find $E(X^2)$. Let $Y = 2X + 3.75$.

Find $E(Y)$, $E(Y^2)$ $\text{Var}(Y)$

Ans: $\text{Var}(X) = E(X^2) - (E(X))^2$

$$\Rightarrow E(X^2) = \text{Var}(X) + (E(X))^2$$

$$= 2.8 + (1.2)^2 = 4.24$$

$$E(Y) = E(2X + 3.75)$$

$$= 2E(X) + 3.75 = 6.15$$

$$E(Y^2) = E((2X + 3.75)^2)$$

$$= E(4X^2 + 2 \times 2 \times 3.75X + 3.75^2)$$

$$= 4E(X^2) + 15E(X) + 14.0625$$

$$= 4(4.24) + 15(1.2) + 14.0625$$

$$= 49.0225$$

$$\text{Var}(Y) = E(Y^2) - (E(Y))^2$$

$$= 49.0225 - (6.15)^2$$

$$= 11.2$$