Note Title 2/28/2011

Q85

For a R.V. X with $E(X) = 1.2$
& variance $Var(X) = 2.8$.
(Its full distribution / W.A is unknown)
Find $E(X^2)$. Let $Y = 2X + 3.75$.
Find $E(Y)$, $E(Y^2)$ $Var(Y)$

Ans: $Var(X) = E(X^2) - (E(X))^2$

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

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

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

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

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

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

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

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

$= 49.0225$

$Var(Y) = E(Y^2) - (E(Y))^2$

$= 49.0225 - (6.15)^2$

$= 11.2$