

PROPERTIES OF EXPECTATION AND VARIANCE

Let X, Y be any two r.v.'s
and a, b be any two real numbers.

$$\underline{1}, \quad E(aX + bY) = aEX + bEY$$

$$\underline{2a}, \quad E(aX + b) = aEX + b$$

$$\underline{2b}, \quad \text{Var}(aX + b) = a^2 \text{Var}(X)$$



If X, Y are independent r.v.'s
then we also have:

$$\underline{3a}, \quad E(XY) = (EX)(EY)$$

$$\underline{3b}, \quad \text{Var}(aX + bY) = a^2 \text{Var}(X) + b^2 \text{Var}(Y)$$