#1 [Version A] / #2 [Version B]: The set of possible values has gaps, or is "countable".

#2 [VA] / #6 [VB]. Let A = "win", B = "sellout".
(a) P(A ∪ B) = P(A) + P(B) - P(A ∩ B) = 0.7 + 0.6 - 0.54 = 0.76
(b) 1 - P(A ∪ B) = 1 - 0.76 = 0.24
(c) P(A | B) = \frac{P(A ∩ B)}{P(B)} = \frac{0.54}{0.6} = 0.9

d) P(A | B) ≠ P(A), so A and B are NOT independent.
(e) [VA]: (30)(0.7) + (-50)(0.3) = $6
   [VB]: (20)(0.7) + (-40)(0.3) = $2

#3 [VA]:
(a) P(A ∩ B) = P(A)P(B) = (0.2)(0.5) = 0.1
   (b) P(A ∪ B) = P(A) + P(B) - P(A ∩ B) = 0.2 + 0.5 - 0.1 = 0.6
   (c) P(A | B) = P(A) = 0.2 since A, B are independent

#4 [VB]:
(a) P(A ∩ B) = P(A)P(B) = (0.4)(0.5) = 0.2
   (b) P(A ∪ B) = P(A) + P(B) - P(A ∩ B) = 0.4 + 0.5 - 0.2 = 0.7
   (c) P(A | B) = P(A) = 0.4 since A, B are independent.

#4 [VA] / #3 [VB]: (a) bar graph, Categorical
   (b) 35 (c) \frac{10}{35} ≈ 0.28

#5 [VA] / #5 [VB]: (a) box plots, numerical
   (b) They have a similar spread. Drug 2 has a distribution with a greater center.
   (c) Drug 1: Median ≈ 0.3 hours
       Drug 2: Median ≈ 1.9 hours
$\#6 \ [v.\ A]/\#9 \ [v.\ B]: \ X \sim \text{binomial} \ (n=6, \ p=0.80)$

(a) $P(X \geq 4) = 1 - P(X \leq 3) = 1 - 0.99 = 0.01$

(b) $P(X \leq 2) = 0.17$

(c) $P(X=3) = P(X \leq 3) - P(X \leq 2) = 0.09 - 0.17 = 0.082$

(d) $\mu = np = 6(0.80) = 4.8$

$\#7 \ [v.\ A]$ (a) all $P(x) \geq 0$, $\sum P(x) = 0.45 + 0.40 + 0.15 = 1$

(b) $\sum xP(x) = (0)(0.45) + (1)(0.40) + (2)(0.15) = 0.7$

(c) $\sum x^2 P(x) = (0^2)(0.45) + (1^2)(0.40) + (2^2)(0.15) = 1.0$

$\sigma^2 = 1.0 - (0.7)^2 = 0.51 \Rightarrow \sigma = \sqrt{0.51} = 0.714$

$\#1 \ [v.\ B]$ (a) all $P(x) \geq 0$, $\sum P(x) = 0.45 + 0.35 + 0.20 = 1$

(b) $\sum xP(x) = (0)(0.45) + (1)(0.35) + (2)(0.20) = 0.75$

(c) $\sum x^2 P(x) = (0^2)(0.45) + (1^2)(0.35) + (2^2)(0.20) = 1.15$

$\sigma^2 = 1.15 - (0.75)^2 = 0.5875 \Rightarrow \sigma = \sqrt{0.5875} = 0.7665$

$\#8 \ [v.\ A]$ Let $A=$ paperback, $B=$ Boston

$P(B|A) = \frac{P(A|B)P(B)}{P(A|B)P(B) + P(A|B^c)P(B^c)} = \frac{(0.25)(0.60)}{(0.25)(0.60) + (0.75)(0.40)} = 0.5172$

$\#8 \ [v.\ B]$ \hspace{2cm} $P(B|A) = \frac{P(A|B)P(B)}{P(A|B)P(B) + P(A|B^c)P(B^c)} = \frac{(0.25)(0.60)}{(0.25)(0.60) + (0.45)(0.40)} = 0.4545$

$\#9 \ [v.\ A]$ \hspace{2cm} $\lambda = 8.5 \Rightarrow (a) P(5) = e^{-8.5}(8.5)^5 \frac{8.5!}{5!} = 0.075$

(b) Let $X=$ morning cars, $Y=$ evening cars

$E(X+Y) = E(X) + E(Y) = 8.5 + 6.5 = 15$

$\#7 \ [v.\ B]$ \hspace{2cm} $\lambda = 6.5 \Rightarrow (a) P(5) = e^{-6.5}(6.5)^5 \frac{6.5!}{5!} = 0.1454$

(b) $E(X+Y) = E(X) + E(Y) = 6.5 + 4.5 = 11$