Form B

8. (a) iv (b) i (c) iii (d) ii

1. Histogram (b) goes with Boxplot i, which appears to have $Q_3 \approx 18$ and max ≈ 23. The 0.8-quartile, or 80th percentile is somewhere in between, probably around 19.
2. Histogram (a) is roughly right-skewed and unimodal.
3. As Histogram (a) is right-skewed, the median is smaller.
4. The standard deviation is somewhere around 3.
5. Boxplot iii likely has min ≈ 7, and max ≈ 22. So, range $= 22 - 7 = 15$.
6. Boxplot ii likely has Q_1 around 8 and Q_3 around 19. So, IQR $= 19 - 8 = 11$.
7. The boxplotter will not allow a whisker to be longer than $1.5 \times$ IQR. These are values that lay farther out than $1.5 \times$ IQR from Q_3, so were plotted individually.

9. (a) i (b) v (c) ii (d) iii

10. (a) A and B are independent, since

$$P(A \mid B) = \frac{1}{4} = P(A) \qquad \left(\text{Similarly, } P(B|A) = \frac{1}{13} = P(B).\right)$$

Knowledge of B does not affect the probability of A, nor vice versa.

(b) A and B are not disjoint, but they are independent. So, false.

12. (a) $Pr(X = 4) = 1 - P(X=0) - P(X=1) - P(X=2) - P(X=3) = 0.3$

(b) $Pr(X \leq 2) = P(X=0) + P(X=1) + P(X=2) = 0.55$

(c) $Pr(X \text{ is even}) = P(X=0) + P(X=2) + P(X=4) = 0.1 + 0.4 + 0.3 = 0.8$

(d) $\mu_x = \sum x\,p(x) = 0(0.1) + 1(0.05) + 2(0.4) + 3(0.15) + 4(0.3) = 2.5$

(e) $Var(X) = \sum (x - \mu_x)^2 p(x)$

$= (-2.5)^2(0.1) + (-1.5)^2(0.05) + (-0.5)^2(0.4) + (0.5)^2(0.15) + (1.5)^2(0.3)$

$= 1.55$

So $\sigma_x = \sqrt{1.55} \doteq 1.245$

(f) 6 or more is achieved by

2 then 4

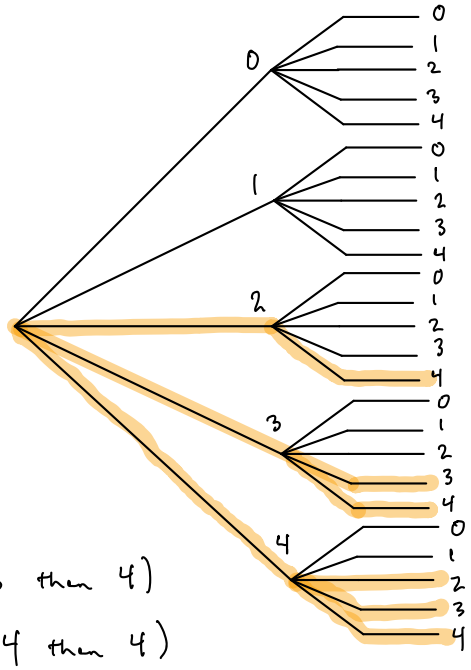
3 then 3

3 then 4

4 then 2

4 then 3

4 then 4



(g) $\Pr(\text{at least 6})$

$= \Pr(2 \text{ then } 4) + \Pr(3 \text{ then } 3) + \Pr(3 \text{ then } 4)$

$+ \Pr(4 \text{ then } 2) + \Pr(4 \text{ then } 3) + \Pr(4 \text{ then } 4)$

$= (0.4)(0.3) + (0.15)^2 + (0.15)(0.3) + (0.3)(0.4)$

$+ (0.3)(0.15) + (0.3)^2$

$= 0.4425$

13. Answers vary. I will send an email with comments.