Chapter 3, Review Problem 4:

(a) The percentage of women with blood pressure above 133 mmHg is equal to the sum of the areas of the bars to the right of 130. This is clearly much less than half the total area, so the answer is 25%.

(b) This is the entire histogram, so only 99% makes sense here.

(c) The area of the bar over the interval 135–140 mmHg is (approximately) equal to $5 \times 1.2 = 6\%$ and the area of the bar over the interval 140–150 mmHg is (approximately) $10 \times 0.8 = 8\%$, so the interval 140–150 mmHg has more women.

(d) There are (approximately) 1.2% women per mmHg in the interval 135–140 and (approximately) 0.8% women per mmHg in the interval 140–150, so the interval 135–140 is more 'crowded'.

(e) The percentage of women with blood pressure in the range 125–130 mmHg is (approximately) $5 \times 2.1 = 10.5\%$.

Chapter 4, Review Problem 7:

(a) The average weights in pounds are $2.2 \times 66 = 145.2 \approx 145$ lbs for men and $2.2 \times 55 = 121$ lbs for women. The SDs in pounds are both $2.2 \times 9 = 19.8 \approx 20$ lbs.

(b) The range 57 kg to 75 kg is 66 ± 9, i.e., it is Avg $\pm$ 1 SD for men. Using the rule-of-thumb described in the box in Section 5 of the chapter (near the top of page 68), we can guess that about 68% of the men have weights in this range.[†]

(c) The SD measures the spread in the data. If we take the weights of the men and women together, the combined data is more spread out (because of the small women and the large men), so the SD of the combined data will be bigger than 9 kg.

Chapter 5, Review Problem 3: *We are assuming that the SAT scores in 1967 follow the normal curve as do the scores in 1994.*

(a) In 1967 the average of the scores was 543 and the SD was 110. A score of 700 is 157 points above average which translates to $157/110 \approx 1.427$. Since the scores follow the normal curve, the percentage of students with scores above 700 will be approximately equal to the area under the normal curve to the right of 1.427.

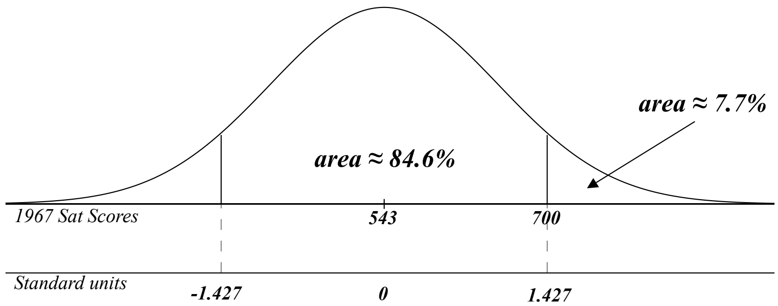
The normal table in the book doesn't have an entry for 1.427, so we take the *average of the entries* for 1.4 and 1.45, which is

$$\frac{83.85\% + 85.29\%}{2} \approx 84.6\%.$$

[†]This rule of thumb assumes that the distribution of weights is approximately *normal*.

This is (approximately) the area under the normal curve between -1.427 and 1.427, so the area under the normal curve outside this region is $100\% - 84.6\% = 15.4\%$. The area under the normal curve to the right of 1.427 is *half* of this, so the percentage of students who scored over 700 in 1967 was approximately

$$\frac{15.4\%}{2} \approx 7.7\%.$$



(b) We repeat the steps of part (a). The difference is that the average score in 1994 was 499. In this case, a score of 700 is $201/110 \approx 1.83$ standard deviations above average, so the percentage of students with this score will be (approximately) equal to the area under the normal curve to the right of 1.827.

Once again, there is no entry in the normal table in the book for 1.827, so we take the average of entries for 1.8 and 1.85, which is

$$\frac{92.81\% + 93.57\%}{2} \approx 93.2\%.$$

As before, this is the (approximate) area under the normal curve between -1.827 and 1.827, so the area under the curve to the right of 1.827 is

$$\frac{100\% - 93.2\%}{2} \approx 3.4\%.$$

Conclusion: approximately 3.4% of the students in 1994 had SAT scores above 700.