

10. The SD is much smaller than the r.m.s. size. See p. 72.
 11. No.
 12. Yes; for instance, the list 1, 1, 16 has an average of 6 and an SD of about 7.

Chapter 5. The Normal Approximation for Data

Set A, page 82

1. (a) 60 is 10 above average; that's 1 SD. So 60 is +1 in standard units. Similarly, 45 is -0.5 and 75 is $+2.5$.
 (b) 0 corresponds to the average, 50. The score which is 1.5 in standard units is 1.5 SDs above average; that's $1.5 \times 10 = 15$ points above average, or 65 points. The score 22 is -2.8 in standard units.
 2. The average is 10; the SD is 2.
 (a) In standard units, the list is $+1.5, -0.5, +0.5, -1.5, 0$.
 (b) The converted list has an average of 0 and an SD of 1. (This is always so: when converted to standard units, any list will average out to 0 and the SD will be 1.)

Set B, page 84

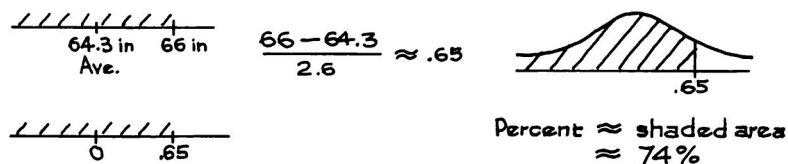
1. (a) 11% (b) 34% (c) 79%
 (d) 25% (e) 43% (f) 13%
 2. (a) 1 (b) 1.15
 3. (a) 1.65
 (b) 1.30. It's NOT the same z as in (a).



4. (a) $100\% - 39\% = 61\%$.
 (b) impossible without further information
 5. (a) $58\% \div 2 = 29\%$ (b) $50\% - 29\% = 21\%$.
 (c) impossible without further information.

Set C, page 88

1. (a)



- (b) 69% (c) 0.2 of 1%.

2. (a) 77% (b) 69%
3. In figure 2, the percentage of women with heights between 61 inches and 66 inches is exactly equal to the area under the histogram and approximately equal to the area under the normal curve.

Set D, page 89

1. (a) 75% (b) \$29,000
(c) 75%. Reason: $90\% - 10\% = 80\%$ are in the range \$15,000 to \$135,000; and \$15,000 to \$125,000 is about the same range but a little smaller.
2. 5, 95.
3. \$7,000.
4. The area to the left of the 25th percentile has to be 25% of the total area, so the 25th percentile must be quite a bit smaller than 25 mm.
5. (a) It has fatter tails.
(b) The interquartile range is about 15.

Set E, page 92

1. She was 2.15 SDs above average, at the 98th percentile.
2. The score is 0.85 SDs above average, which is $0.85 \times 100 \approx 85$ points above average. That's $535 + 85 = 620$.
3. 2.75 points—0.50 SDs below average.

Set F, page 93

1. (a) The average is

$$\frac{5}{9} \times (98.6 - 32) = 37.0$$

The SD is

$$\frac{5}{9} \times 0.3 = 0.17$$

- (b) In standard units, the change of scale washes out, so the answer is 1.5.

Chapter 7. Plotting Points and Lines

Set A, page 111

1. $A = (1, 2)$ $B = (4, 4)$ $C = (5, 3)$ $D = (5, 1)$ $E = (3, 0)$.
2. x up by 3, y up by 2.
3. Point D.