Normal Distribution – Tutorial Exercise Answers

Exercise 5.1

1 (i) 0.8089   (ii) 0.8089
   (iii) 0.1911 (iv) 0.1911
2 (i) 0.0359   (ii) 0.1911
   (iii) 0.2578 (iv) 0.3023
   (v) 0.0049   (vi) 0.4798
   (iii) 0.9931 (iv) 0.9131
   (v) 0.9911
   (vii) 0.9686 (viii) 0.2343
   (vii) 0.9484
   (ix) 0.0312   (x) 0.0306
   (xi) 0.05
   (iii) 0.9803
   (xiii) 0.0021
3 (i) 0.05
   (iii) 0.0999 ≈ 0.1   (iv) 0.025
   (v) 0.995   (v) 0.01
   (vii) 0.0025 (vii) 0.975

4 (i) 0.044   (ii) 0.8185
5 (i) 0.1703   (ii) 0.1336
   (iii) 0.3639 (iv) 0.5481
   (v) 0.4798   (vi) 0.4582
   (vii) 0.0337 (viii) 0.9624
   (ix) 0.9082   (x) 0.2729
6 (i) 0.925   (x) 0.0306
7 49.98% ≈ 50%
8 (i) 0.9   (ii) 0.7
9 (i) 0.55   (ii) 0.15
10 (i) 0.9   (ii) 0.1

Exercise 5.2

1 (i) 0.0668   (ii) 0.4013
2 (i) 0.7190   (iv) 0.0618
   (iv) 0.0456   (iii) 0.4621
3 (i) 0.0548   (ii) 0.1448   (iii) 0.1747
4 (i) 0.0106   (ii) 0.9857   (iii) 0.9544
5 (i) 0.3015   (ii) 0.5231   (iii) 0.3792
6 (a) (i) 0.8413   (ii) 0.9257
7 207
8 (i) 0.6554   (ii) 0.1171...   (iii) 8.2 ≈ 8
9 (i) 0.1056   (ii) 0.7734   (iii) 0.6678
10 Size 1: 0.159, Size 2: 0.775, Size 3: 0.067
11 0.8664
12 (i) 2   (ii) 454   (iii) 124

Exercise 5.3

1 (i) 73.85   (ii) 4.65
   (iii) 190.742 (iv) 1.468
2 (i) 176.578 (ii) 166.723
3 (i) 625.6 g (ii) 567.1 g
4 (i) (384.32, 415.68)   (ii) 10.784
5 (i) 0.383   (ii) 96.74
6 (i) (125.5h, 194.5h)
7 (i) 0.4839   (ii) 96.92, 103.08

Exercise 5.4

1 40
2 10.73
3 (i) 8.31   (ii) 35.9%
4 (i) 35.5   (ii) 0.0907
5 1.75 m
6 2.74 kg, 2.78 kg
7 52.73, 11.96
8 (i) 6.99, 0.105   (ii) 0.0105
9 39.5, 5.32   (ii) 14.25
10 (i) 0.321   (ii) 4.46
11 0.203
12 (i) 92.7%   (ii) 1.32   (iii) 1.7%
13 5.102 g
14 (i) 58.79, 3.304
15 3040 km
16 (i) 828.45 g   (ii) 0.615 g
17 (i) 0.507   (ii) 0.00258
18 535.1 g, 12.22 g
19 (i) 109 km/h   (ii) 0.428
20 (i) 0.9332   (ii) $\mu = 0.9\sigma$

Exercise 5.5

1 0.1958
2 (i) 9.5, 5.89   (ii) $np = 9.5 > 5$, $nq = 15.5 > 5$
   (iii) (a) 0.4932   (b) 0.0968
   (c) 0.1082   (d) 0.6598
3 (i) 0.0154   (ii) 0.8145   (iii) 0.02
4 0.1174
5 (i) 0.678
6 (i) (a) 0.0318   (b) 0.8345
   (ii) 0.9474   (b) 0.6325   (iii) 0.5914
   (iv) 0.0111
7 (i) 0.4502   (b) 0.9222   (iii) 0.484
8 (i) (a) 0.2304   (b) 0.9222   (iii) 0.484
   (ii) 0.0996
9 0.1432
10 (i) 0.1853   (ii) 0.1838   (iii) 0.81%
11 (i) 0.0829   (ii) 0.2749
12 (i) 0.0014
   (ii) 0.8531
13 (i) (a) 0.0255   (ii) 0.00361   (iii) 0.5742
   (i) 0.117   (ii) 0.00361   (iii) 0.556
14 0.8871
15 0.8724
10 (i) 2.23   (ii) 0.6542   (iii) 0.112
   (iv) 0.2495   (ii) 0.0419
11 (i) 0.3735
   (iii) Does not agree with model;
   not symmetrical, so not normal
12 (i) 0.398   (ii) 9   (iii) 0.9717
13 (i) 108.42, 13.4   (iii) 0.4309

Exercise 5.6

1 (i) 72.00   (ii) 0.370
2 (i) 0.0088   (ii) 7.84; 42.16, 57.84
3 (i) 0.0276   (ii) 7.72
4 (i) 0.0036   (ii) 0.110
5 (i) 16.2, 1.67   (ii) 0.274
6 (i) 0.2025   (ii) 480.8 g
7 (i) 8.752   (ii) 0.5458
8 (i) 7.29   (ii) 0.136   (iii) 0.370
9 (i) 0.298   (ii) 0.118   (iii) 13