

EXERCISE 13.2

1. $\frac{3}{25}$ 2. $\frac{25}{102}$ 3. $\frac{44}{91}$
 4. A and B are independent 5. A and B are not independent
 6. E and F are not independent
 7. (i) $p = \frac{1}{10}$ (ii) $p = \frac{1}{5}$
 8. (i) 0.12 (ii) 0.58 (iii) 0.3 (iv) 0.4
 9. $\frac{3}{8}$ 10. A and B are not independent
 11. (i) 0.18 (ii) 0.12 (iii) 0.72 (iv) 0.28
 12. $\frac{7}{8}$ 13. (i) $\frac{16}{81}$, (ii) $\frac{20}{81}$, (iii) $\frac{40}{81}$
 14. (i) $\frac{2}{3}$, (ii) $\frac{1}{2}$ 15. (i), (ii) 16. (a) $\frac{1}{5}$, (b) $\frac{1}{3}$, (c) $\frac{1}{2}$
 17. D 18. B

EXERCISE 13.3

1. $\frac{1}{2}$ 2. $\frac{2}{3}$ 3. $\frac{9}{13}$ 4. $\frac{12}{13}$
 5. $\frac{198}{1197}$ 6. $\frac{4}{9}$ 7. $\frac{1}{52}$ 8. $\frac{1}{4}$
 9. $\frac{2}{9}$ 10. $\frac{8}{11}$ 11. $\frac{5}{34}$ 12. $\frac{11}{50}$
 13. A 14. C

EXERCISE 13.4

1. (ii), (iii) and (iv) 2. $X = 0, 1, 2$; yes 3. $X = 6, 4, 2, 0$

4. (i)

X	0	1	2
P(X)	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{4}$

(ii)

X	0	1	2	3
P(X)	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{8}$

(iii)

X	0	1	2	3	4
P(X)	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{16}$

5. (i)

X	0	1	2
P(X)	$\frac{4}{9}$	$\frac{4}{9}$	$\frac{1}{9}$

(ii)

X	0	1
P(X)	$\frac{25}{36}$	$\frac{11}{36}$

6.

X	0	1	2	3	4
P(X)	$\frac{256}{625}$	$\frac{256}{625}$	$\frac{96}{625}$	$\frac{16}{625}$	$\frac{1}{625}$

7.

X	0	1	2
P(X)	$\frac{9}{16}$	$\frac{6}{16}$	$\frac{1}{16}$

8. (i) $k = \frac{1}{10}$ (ii) $P(X < 3) = \frac{3}{10}$ (iii) $P(X > 6) = \frac{17}{100}$

(iv) $P(0 < X < 3) = \frac{3}{10}$

9. (a) $k = \frac{1}{6}$ (b) $P(X < 2) = \frac{1}{2}$, $P(X \leq 2) = 1$, $P(X \geq 2) = \frac{1}{2}$

10. 1.5 11. $\frac{1}{3}$ 12. $\frac{14}{3}$

13. $\text{Var}(X) = 5.833$, $\text{S.D} = 2.415$

14.

X	14	15	16	17	18	19	20	21
P(X)	$\frac{2}{15}$	$\frac{1}{15}$	$\frac{2}{15}$	$\frac{3}{15}$	$\frac{1}{15}$	$\frac{2}{15}$	$\frac{3}{15}$	$\frac{1}{15}$

Mean = 17.53, $\text{Var}(X) = 4.78$ and $\text{S.D}(X) = 2.19$

15. $E(X) = 0.7$ and $\text{Var}(X) = 0.21$

16. B

17. D

EXERCISE 13.5

1. (i) $\frac{3}{32}$ (ii) $\frac{7}{64}$ (iii) $\frac{63}{64}$
2. $\frac{25}{216}$ 3. $\left(\frac{29}{20}\right)\left(\frac{19}{20}\right)^9$
4. (i) $\frac{1}{1024}$ (ii) $\frac{45}{512}$ (iii) $\frac{243}{1024}$
5. (i) $(0.95)^5$ (ii) $(0.95)^4 \times 1.2$ (iii) $1 - (0.95)^4 \times 1.2$
 (iv) $1 - (0.95)^5$
6. $\left(\frac{9}{10}\right)^4$ 7. $\left(\frac{1}{2}\right)^{20} [{}^{20}C_{12} + {}^{20}C_{13} + \dots + {}^{20}C_{20}]$
9. $\frac{11}{243}$
10. (a) $1 - \left(\frac{99}{100}\right)^{50}$ (b) $\frac{1}{2} \left(\frac{99}{100}\right)^{49}$ (c) $1 - \frac{149}{100} \left(\frac{99}{100}\right)^{49}$
11. $\frac{7}{12} \left(\frac{5}{6}\right)^5$ 12. $\frac{35}{18} \left(\frac{5}{6}\right)^4$ 13. $\frac{22 \times 9^3}{10^{11}}$
14. C 15. A

Miscellaneous Exercise on Chapter 13

1. (i) 1 (ii) 0
2. (i) $\frac{1}{3}$ (ii) $\frac{1}{2}$
3. $\frac{20}{21}$
4. $1 - \sum_{r=7}^{10} {}^{10}C_r (0.9)^r (0.1)^{10-r}$
5. (i) $\left(\frac{2}{5}\right)^6$ (ii) $7\left(\frac{2}{5}\right)^4$ (iii) $1 - \left(\frac{2}{5}\right)^6$ (iv) $\frac{864}{3125}$

6. $\frac{5^{10}}{2 \times 6^9}$

7. $\frac{625}{23328}$

8. $\frac{2}{7}$

9. $\frac{31}{9} \left(\frac{2}{3} \right)^4$

10. $n \geq 4$

11. $\frac{11}{216}$

12. $\frac{1}{15}, \frac{2}{5}, \frac{8}{15}$

13. $\frac{14}{29}$

14. $\frac{3}{16}$

15. (i) 0.5 (ii) 0.05

16. $\frac{16}{31}$

17. A

18. C

19. B

