

13. (a) $\frac{1}{26}$ (b) $\frac{9}{13}$ (c) $\frac{1}{13}$
 (d) $\frac{5}{26}$ (e) $\frac{21}{26}$

14. (a) (i) $\frac{5}{12}$ (ii) $\frac{2}{3}$ (iii) $\frac{1}{3}$
 (b) (ii) (a) $\frac{9}{55}$ (b) $\frac{1}{220}$
 (c) $\frac{21}{55}$ (d) $\frac{34}{55}$

15. (a) $x = 50$
 (b) Sector D. Angle of sector D is the smallest.
 (c) (i) $\frac{205}{648}$ (ii) $\frac{443}{648}$
 (d) $\frac{23}{144}$

16. (a) (i) $w + x = 8$,
 $w + 5x = 20$
 (b) $\frac{11}{12}$

17. (b) $m = 10$ or $m = -9$
 (c) (i) 10 (ii) 4

18. (b) (i) $\frac{2}{5}$ (ii) $\frac{4}{15}$ (iii) $\frac{1}{6}$

19. (a) Yes. 1000 units available separately for investors who subscribed for 1, 5 and 10 units.
 (b) (i) $\frac{1}{180}$ (ii) $\frac{73}{180}$ (iii) $\frac{47}{180}$

20. (a) $\frac{4913}{8000}$ (b) $\frac{44}{125}$ (c) $\frac{2299}{4000}$

Challenging Practice

21. (a) $\frac{3}{4}$ (b) $\frac{3}{256}$ (c) $\frac{1}{256}$

22. (b) $\frac{1}{10}$
 (c) (i) $\frac{209}{250}$ (ii) $\frac{41}{250}$

23. (a) $\frac{7}{20}$
 (b) The game is not fair since the probability of winning is less than $\frac{1}{2}$.

24. $\frac{1}{4}$

25. 0.425

Enrichment

26. (a) $\frac{1}{1024}$ (b) $\frac{781}{1024}$ (c) $\frac{405}{1024}$ (d) 1

27. (a) $k = 0.4$ (or $\frac{2}{5}$)
 (b) (i) 0.251 (ii) 0.6156

28. (a) (i) $\frac{5}{9}$ (ii) $\frac{1}{3}$ (iii) $\frac{1}{9}$
 (b) (i) The possible scores are 2, 4, 6, 8 and 10.
 (ii) $P(\text{score} = 2) = \frac{25}{81}$
 $P(\text{score} = 4) = \frac{10}{27}$
 $P(\text{score} = 6) = \frac{19}{81}$
 $P(\text{score} = 8) = \frac{2}{27}$
 $P(\text{score} = 10) = \frac{1}{81}$

29. (a) 0.999 975 (b) 0.999 925

Chapter 3 Matrices

Basic Practice

1. (a) 1×2 (b) 1×3 (c) 2×3
 (d) 4×2 (e) 3×3 (f) 1×1

2. (a) $a = 7, b = -3$ (b) $c = -2, d = -5$
 (c) $e = 10, f = -5$ (d) $g = -3, h = -4, j = -7$
 (e) $k = 8, m = 7, n = 11$ (f) $p = 2, q = -2, r = 7$
 (g) $w = 49, x = 155$ (h) $y = 0, z = 2$

3. (a) $\begin{pmatrix} 15 & 19 & 18 & 20 \\ 10 & 16 & 21 & 19 \\ 19 & 14 & 10 & 12 \end{pmatrix}$
 (b) Mohan scored 21 goals in the 2005 soccer league.
 (c) (i) 121
 (ii) Altogether, Mohan and Raddy scored 121 goals in leagues from 2003 to 2006.

4. (a) $\begin{pmatrix} 21 & 23 \\ 14 & 18 \\ 18 & 20 \end{pmatrix}$
 (b) Meng Seng's English test score before remedial was 14.
 (c) There was improvement in English score after the remedial lessons.

5. (a) $(15 \quad -3)$ (b) $\begin{pmatrix} -7 & 1 \\ 12 & 3 \end{pmatrix}$
 (c) $\begin{pmatrix} 21 & -3 \\ -18 & 1 \\ 4 & 11 \end{pmatrix}$ (d) $\begin{pmatrix} a & 3a - 8 & 0 \\ 2a & a + 4 & 2a \end{pmatrix}$
 (e) $\begin{pmatrix} 4 \\ -7 \\ 1 \end{pmatrix}$ (f) $(16 \quad 10 \quad 26 \quad -10)$
 (g) $\begin{pmatrix} -7 & 0 \\ 15 & -30 \\ 6 & 0 \\ -15 & -9 \end{pmatrix}$ (h) $\begin{pmatrix} -1 & -8 \\ 6b & 16 \end{pmatrix}$

6. (a) $\begin{pmatrix} 9 \\ -13 \end{pmatrix}$ (b) $\begin{pmatrix} -2 & 11 \\ 2 & -17 \end{pmatrix}$
 (c) $\begin{pmatrix} 20 & 2 & -11 \\ -9 & -16 & 15 \end{pmatrix}$