CHAPTER 16 Probability

The use of "dice" as the singular is controversial. We have kept to "dice" rather than "die" because it is common usage.

EXERCISE 16a (p. 273)

The work in this exercise revises the work in Book 2A on the probability of a single event.

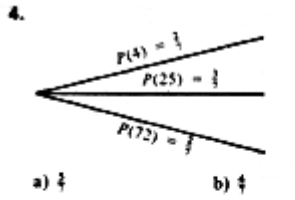
1. a) $\frac{4}{9}$ b) $\frac{7}{9}$ c) 1 d) 0
2. a) $\frac{1}{13}$ b) $\frac{1}{4}$ c) $\frac{9}{13}$
3. a) $\frac{31}{90}$ b) $\frac{1}{10}$
4. a) $\frac{21}{26}$ b) $\frac{4}{13}$ c) $\frac{7}{26}$
5. a) 1 b) $\frac{1}{5}$
6. a) $\frac{4}{9}$ b) $\frac{5}{9}$
7. a) 0.53
8. a) $\frac{4}{9}$ b) $\frac{5}{9}$
9. a) $\frac{1}{3}$
10. a) $\frac{151}{153}$
11. a) $\frac{4}{7}$

EXERCISE 16b (p. 277)

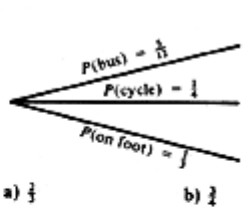
This section introduces the idea of addition of probabilities for mutually exclusive events, but the words "mutually exclusive" are not used. Plenty of discussion is needed, with other examples, to illustrate the idea of separate events, i.e. situations when either A or B can occur, but not both. The scores on a dice give a simple illustration, e.g. P(either a 2 or a 3) is $P(2) + P(3)$, but P(a 2 or a prime) is *not* $P(2) + P$(prime).

1. a) $\frac{1}{6}$ b) $\frac{1}{6}$ c) $\frac{1}{3}$
2. a) $\frac{5}{9}$ b) $\frac{4}{9}$
3. a) $\frac{3}{10}$ b) $\frac{7}{10}$

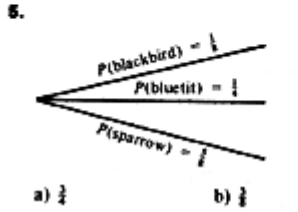
4.



6.



5.



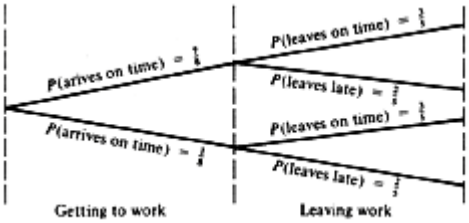
7. 2 **8.** 80 **9.** 3 **10.** 50

EXERCISE 16c (p. 281)
Revises the work in Book 2A on possibility spaces.

1. a) $\frac{5}{36}$ b) $\frac{1}{6}$ c) 0
2. a) $\frac{1}{4}$ b) $\frac{3}{4}$ c) $\frac{1}{2}$
3. a) $\frac{7}{12}$ b) $\frac{2}{3}$ c) $\frac{13}{36}$
4. a) $\frac{1}{4}$ b) $\frac{1}{4}$ c) $\frac{1}{9}$
5. a) $\frac{1}{2}$ b) $\frac{1}{4}$ c) $\frac{1}{4}$
6. a) $\frac{1}{4}$ b) $\frac{3}{4}$
7. $\frac{7}{12}$

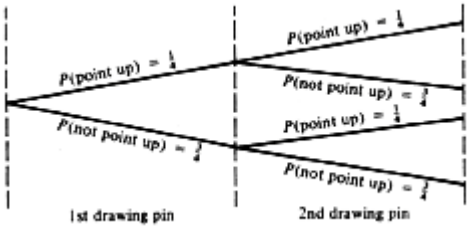
EXERCISE 16d (p. 283)
All questions on probability trees use independent events. Dependent events are introduced in Book 4A.

1. a) $\frac{2}{5}$
b)



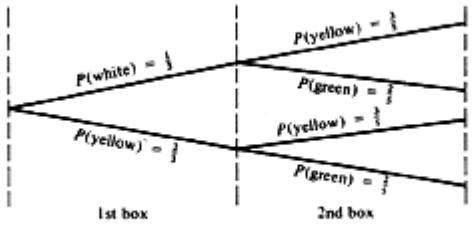
c) $\frac{7}{20}$ d) $\frac{3}{40}$

2. a) $\frac{3}{4}$



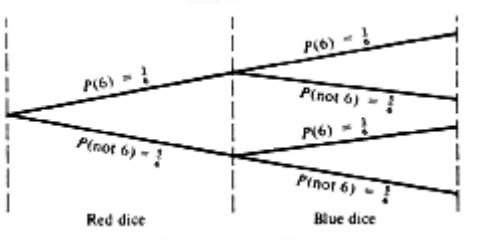
b) $\frac{1}{16}$ c) $\frac{9}{16}$

3.



a) $\frac{2}{5}$ b) $\frac{2}{15}$

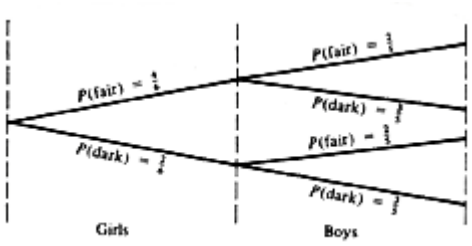
4. (i) a) $\frac{1}{6}$ b) $\frac{5}{6}$



(ii) a) $\frac{1}{36}$ b) $\frac{5}{36}$ c) $\frac{5}{36}$ d) $\frac{5}{18}$

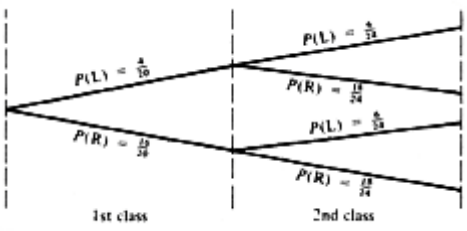
EXERCISE 16e (p. 285)

1.



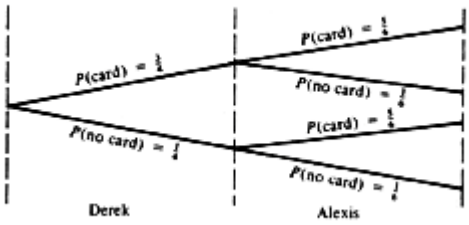
$\frac{8}{15}$

2.



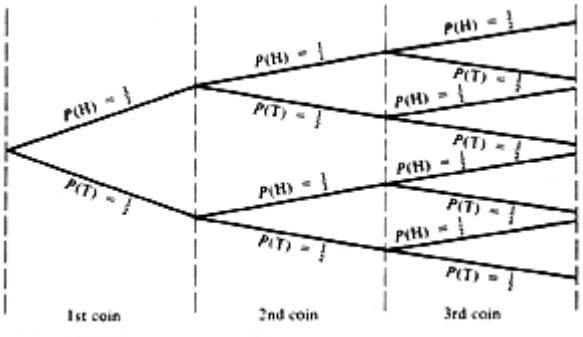
$\frac{7}{20}$

3.



a) $\frac{5}{8}$ b) $\frac{1}{3}$ c) $\frac{1}{24}$ d) 1

4.



a) $\frac{1}{8}$ b) $\frac{1}{8}$ c) $\frac{3}{8}$

EXERCISE 16f (p. 286)

1. a) $\frac{4}{11}$ b) $\frac{4}{11}$

2. a) 0 b) 1

3. a) $\frac{1}{4}$ b) $\frac{1}{8}$ c) $\frac{1}{8}$

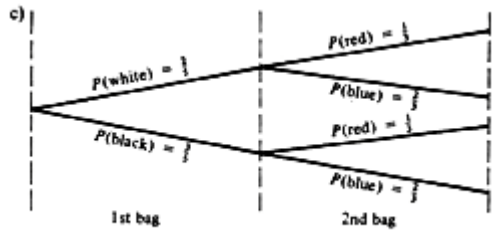
4. a) $\frac{3}{32}$ b) $\frac{7}{16}$

5. b) and d) $\frac{4}{15}$

a)

		2nd bag		
		R	B	B
1st bag	W	x	x	x
	W	x	x	x
	B	x	x	x
	B	x	x	x
	B	x	x	x

c)


c)
P(white) = 1/2
P(black) = 1/2
P(red) = 1/3
P(blue) = 2/3
P(red) = 1/3
P(blue) = 2/3
1st bag
2nd bag