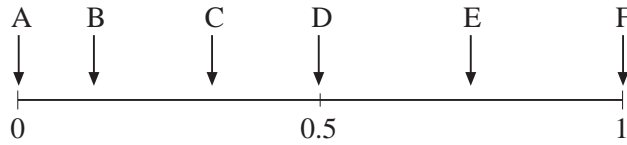**UNIT 6**   *Probability*   **Extra Exercises 6.1**

1.   The following probability line shows the probabilities of 6 events, A, B, C, D, E and F.

     (a)   Which event is *certain* to occur?

     (b)   Which event is the *most unlikely* to occur, but is *not impossible*?

     (c)   Which event is *impossible*?

     (d)   Which events are *more likely* to occur than C?

2.   The diagram shows a jar containing *red* (R), *blue* (B) and *white* (W) balls. One of the balls is taken at random.
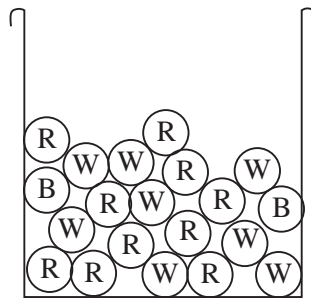
     (a)   What colour is this ball *most likely* to be?

     (b)   What colour is this ball *least likely* to be?

3.   In a game you are given one of the following cards at random:


     (a)   Are you more likely to be given an *odd* number or an *even* number?

     (b)   Are you more likely to be given a 7 than a 5 ?

     (c)   Are you more likely to be given a number *greater* or *less* than 5?

UNIT 6   *Probability*   **Extra Exercises 6.2**

1. A sweet jar contains 10 toffees, 8 mints and 12 chocolates. A sweet is taken at random from the jar. What is the probability that the sweet is:

    (a)   a mint,

    (b)   a toffee,

    (c)   a chocolate,

    (d)   a mint or a toffee,

    (e)   not a mint,

    (f)   a chocolate or a toffee?

2. The diagram shows a spinner. What is the probability that, with one spin, your score is:

    (a)   1,

    (b)   2,

    (c)   greater than 2,

    (d)   less than 4,

    (e)   an even number?
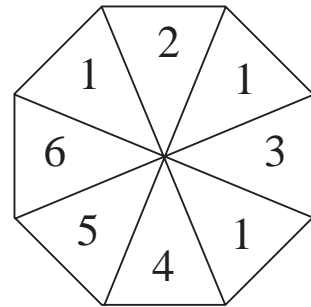
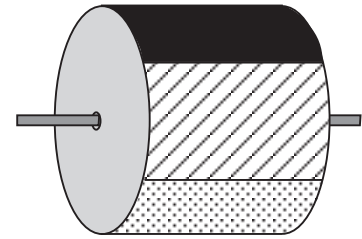

3. Ahmed rolls a fair dice 300 times. How many times would he expect to obtain:

    (a)   6,

    (b)   an even number,

    (c)   a number greater than 1,

    (d)   a number less than 3,

    (e)   a 2 or a 5 ?

UNIT 6   *Probability*   **Extra Exercises 6.3**

1. The curved outer surface of a drum is painted red (R),
    yellow (Y), purple (P), silver (S) and black (B),
    in 5 equal sections.

    The drum is spun twice and the colour uppermost noted.

    (a) Copy and complete this list of possible outcomes:

R R	Y R
R Y	Y Y
R P	....
R S	....
R B	....

    (b) What is the probability that you obtain:

    (i)   2 reds,

    (ii)   the same colour on both spins,

    (iii) a yellow and a red in any order,

    (iii) no yellows.

2. In a game a card is taken at random from a full pack of 52 playing cards. It is then
    replaced, and a second card is taken.

    Use a tree diagram to calculate the probabilities that:

    (a) both cards are diamonds,

    (b) *neither* card is a diamond,

    (c) one of the cards is a diamond,

    (d) at least one card is a diamond.

3. Two fair dice have faces that are numbered,

    $$1,\ \ 1,\ \ 2,\ \ 2,\ \ 3,\ \ 6$$

    (a) Draw a table to list the outcomes when the two dice are rolled together and
         the two scores added to give a total score.

    (b) Calculate the probabilities that the total score on the two dice is:

    (i)   7,   (ii)   greater than 5,

    (iii) an even number,   (iv)   less than 4

    (v)   a multiple of 3.

UNIT 6   *Probability*   **Extra Exercises 6.4**

1.   Sally rolls a dice 300 times.

    (a)   How many sixes would you expect her to obtain?

    (b)   Should she be surprised if she obtained 55 sixes?

2.   (a)   If you toss a fair coin 10 times, how many heads would you expect to obtain?

    (b)   Toss a coin 10 times and record the number of heads that you obtain.

    (c)   Comment on how your answers to parts (a) and (b) compare.

3.   Two unbiased dice are rolled at the same time. The scores are then multiplied together.

    (a)   Use a table to list all the possible outcomes.

    (b)   If the dice were rolled 72 times, how often would you expect to get each score?

    (c)   Conduct an experiment in which you roll the two dice 70 times and compare
        your results with your expected results calculated in part (b).

UNIT 6   *Probability*   **Extra Exercises 6.4**

Extra Exercises 6.1   Answers

1. (a) F   (b) B   (c) A   (d) D, E, F

2. (a) Red   (b) Blue

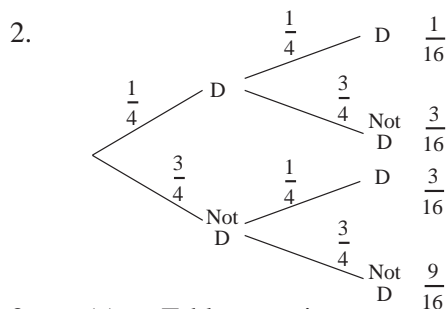3. (a) odd number   (b) no; equally likely   (c) less than 5

Extra Exercises 6.2   Answers

1. (a) $\dfrac{8}{30} = \dfrac{4}{15}$ (b) $\dfrac{10}{30} = \dfrac{1}{3}$ (c) $\dfrac{12}{30} = \dfrac{2}{5}$

   (d) $\dfrac{18}{30} = \dfrac{3}{5}$ (e) $\dfrac{22}{30} = \dfrac{11}{15}$ (f) $\dfrac{22}{30} = \dfrac{11}{15}$

2. (a) $\dfrac{3}{8}$ (b) $\dfrac{1}{8}$ (c) $\dfrac{4}{8} = \dfrac{1}{2}$

   (d) $\dfrac{5}{8}$ (e) $\dfrac{3}{8}$

3. (a) 50   (b) 150   (c) 250
   (d) 100   (e) 100

Extra Exercises 6.3   Answers

1. (a)
R R	Y R	P R	S R	B R
R Y	Y Y	P Y	S Y	B Y
R P	Y P	P P	S P	B P
R S	Y S	P S	S S	B S
R B	Y B	P B	S B	B B

   (b) $\dfrac{1}{25}$ (ii) $\dfrac{5}{25} = \dfrac{1}{5}$ (iii) $\dfrac{2}{25}$ (iv) $\dfrac{16}{25}$

2.

   (a) $\dfrac{1}{16}$ (b) $\dfrac{9}{16}$

   (c) $\dfrac{6}{16} = \dfrac{3}{8}$ (d) $\dfrac{7}{16}$

3. (a) Table opposite

   (b) (i) $\dfrac{4}{36} = \dfrac{1}{9}$ (ii) $\dfrac{12}{36} = \dfrac{1}{3}$

   (iii) $\dfrac{18}{36} = \dfrac{1}{2}$ (iv) $\dfrac{12}{36} = \dfrac{1}{3}$

   (v) $\dfrac{12}{36} = \dfrac{1}{3}$

		Dice B				
		1	1	2	2	3	6
	1	2	2	3	3	4	7
	1	2	2	3	3	4	7
Dice	2	3	3	4	4	5	8
A	2	3	3	4	4	5	8
	3	4	4	5	5	6	9
	6	7	7	8	8	9	12

Extra Exercises 6.4   Answers

1.   (a)   50   (b)   no

2.   5

3.   (a)

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Dice B

	1	2	3	4	5	6
1	1	2	3	4	5	6
2	2	4	6	8	10	12
3	3	6	9	12	15	18
4	4	8	12	16	20	24
5	5	10	15	20	25	30
6	6	12	18	24	30	36

Dice A
</div>

(b)

Score	Expected Frequency
1	2
2	4
3	4
4	6
5	4
6	8
8	4
9	2
10	4
12	8
15	4
16	2
18	4
20	4
24	4
25	2
30	4
36	2