M1.

(a)   Box A → p(3) = $\frac{1}{6}$ and

Box B → p(3) = $\frac{1}{3}$ and

Box C → p(3) = $\frac{2}{5}$ and

Box D → p(3) = $\frac{2}{4}$ or $\frac{1}{2}$

Allow one incorrect probability

M1

(Box) D and all probabilities correct

A1

(b)   (Box) A and (Box) B

B1

[3]

M2.

(a) $\frac{1}{3}$ or $\frac{2}{6}$ or 0.33(...)

or 72 ÷ 6 or 12
or 72 ÷ 6 × 2
                oe

M1

24
                oe

A1

Additional Guidance
24 out of 72

M1A1

$\frac{24}{72}$

M1A0

2 out of 6   or   1 out of 3

M0

(b)   250 − 25 − 53 − 62 or 110

$(25 + 53 + 62) \div 250$ or $\frac{140}{250}$ or 0.56

M1

their 110 ÷ 2   or 55

$1 - \textbf{\textit{their}} \ \frac{140}{250}$

or 1 − 0.56 or 0.44

M1dep

$\frac{55}{250}$ or 0.22 or 22%

ignore fw
oe
$\frac{11}{50}$

A1

Additional Guidance

$\frac{55}{250}$ followed by error eg = 0.2

M1M1A1

55 in table

M1M1A0

Do not allow misreads for 250

[5]

M3.(a)   Yes she's asking people who own dogs so they prefer them

oe
Yes she should ask people who don't own dogs / pets

B1

(b)   No preference = 6

B1

Cats = Dogs × 2

B1

Dogs + Cats + No preference = 30
8, 16, 6 scores B3

B1
[4]

M4.
(a)

	1	2	7
4	4	4	7
5	5	5	7
8	8	8	8

B1 any row or column correct

B2

(b)   2 and 5 on spinner C
and
3 and 4 on spinner D
B1 2, 3, 4 and 5 used but in the wrong position
or
all sections completed so that at least three probabilities are
correct

B2
[4]

M5.

(a) $\dfrac{3}{8}$

oe

B1

(b)   0.2 + 0.4 or 0.6 oe (for bag B)
or
0.625 or 62.5(%) (for bag A)

M1

0.62(5) or 0.63 and 0.6 and bag A

    oe
    both probabilities correct in the same format and bag A

    eg $\dfrac{25}{40}$ *and* $\dfrac{24}{40}$ *and bag A*

A1

[3]

M6.(a)   0.1 × 400 (=40) **or** 0.2 × 500 (=100)

M1

40 **and** 100

A1

140 or 140/900 but not 140 : 900

    SC2 for 760
    SC1 for digits 14…
    ft on their 40 + their 100 if complete correct
    method seen.

A1ft

(b) $\dfrac{4}{10}$ and $\dfrac{3}{9}$ identified as probabilities

    May be on branches of a tree diagram.

M1

$\left(\dfrac{4}{10} \times \dfrac{3}{9}\right) = \dfrac{12}{90} = \dfrac{2}{15}$

    Evidence of cancelling is necessary
    but $\dfrac{12}{90} = \dfrac{2}{15}$ *is enough.*

NB $\frac{2}{5} \times \frac{1}{3}$ *is 2 marks*

	A1
	[5]

M7. 1 1 2 2 2 2 2 3

Any order
B1 for two conditions met
ie
Used 8 cards and at least five 2s
eg 1 2 2 2 2 2 3 3
Used 8 cards and twice as many 1s as 3s
eg 1 1 1 1 2 2 3 3

	B2
	[2]

M8. $\frac{3}{4} - \frac{1}{4}\left(=\frac{1}{2}\right)$

M1

$6 \div 2 \times 3$

3 and 9 chosen

M1

9

SC2 blue = 3 or red + blue = 12

A1

Alternative method 1

Pair of integers with a difference of 6   eg 2 and 8

1 : 3 or 3 : 1

or

Pair of integers with P(blue) = $\dfrac{1}{4}$

eg 1 and 3, 2 and 6, $\dfrac{2}{8}, \dfrac{3}{12}$

M1

3 and 9 chosen

3 : 9   or   9 : 3 chosen

M1

9

SC2   blue = 3   or   red + blue = 12

A1

Algebraic methods are not expected on Unit 1 but, if seen, apply the following schemes

Alternative method 2

b + 6 = 3*b*

$$r - 6 = \dfrac{r}{3}$$

M1

2*b* = 6   or   *b* = 3

3r – 18 = r   or   2r = 18

M1

9

SC2   blue = 3   or   red + blue = 12

A1

Alternative method 3

x red,   (*x* – 6) blue, $\dfrac{x-6}{x+x-6} = \dfrac{1}{4}$ *oe*

M1

$4x - 24 = 2x - 6$

Expanding and eliminating fractions

M1

9

SC2   blue = 3   or   red + blue = 12

A1

[3]

M9.(a)   0.4 (relative frequency of white) or

1 (pink)   *oe*

B1

their $5 \div 10$ (= 0.5)

or

$1 -$ their $0.4 - 0.1 = (0.5)$ *oe*

M1

Fully correct table ie

(4)	1	5
0.4	(0.1)	0.5

*oe accept equivalent fractions or percentages for relative
frequencies throughout*

A1

(b)   Comment about increasing the sample size
eg she should repeat it more times or sample more balls   oe

B1

[4]

M10.
300 ÷ 6 (= 50)
or
120 × 6 (= 720)

oe $\frac{1}{6}$ *oe and* $\frac{120}{300}$ $(=\frac{2.4}{6})$

M1

No and 50
or
No and 36 (average of the other numbers)
or
No and 720

No and any sensible comment linking the theoretical probability and experimental outcome with accurate calculation(s)
SC1 States or implies that 120 is too large a proportion

A1

[2]

M11. (24 ÷ 3) + 5 or 13 or 24 + 15 or 39

oe May be seen as a numerator /

denominator of incorrect fraction eg $\frac{13}{24}$

M1

$\frac{13}{39}$ or

13 **and** 39 or

13, 13, 13 or

13 : 26

A1

Yes ticked and $\frac{13}{39}$ = $\frac{1}{3}$ or

equivalent, eg 3 × 13 = 39,

or 39 ÷ 13 = 3

> *Strand (ii)*
> *ft on wrong calculation for 24 ÷ 3 and No ticked*
> *SC1 Yes ticked (incorrect or no working)*

Q1ft

Alternative method 1

$\dfrac{5}{15}$

M1

$\dfrac{5}{15} = \dfrac{1}{3}$

A1

Yes ticked and clear explanation that same proportion of blue added

> *Strand (ii)*
> *SC1 Yes ticked (incorrect or no working)*

Q1

Alternative method 2

Yes ticked

B1

Full explanation that the extra added are in the same proportion

eg As $\dfrac{1}{3}$ of the extra are blue

> *Strand (ii)*
> *Q1 partial explanation*
> *eg 5 of each colour*

Q2

[3]

)

M12. 3, 3, 4, 4, 2

B2 for two criteria met
eg 3, 3, 3, 4, 4
B1 for one criteria met
eg 3, 3, 4, 4, 4

B3
[3]

M13. (a) $\frac{2}{3} \times 40$ *oe*

$\frac{1}{3} \times 40$

M1

26.(…) or 26 or 27
13.(…) or 13

A1

their 27 **and** No

or

their 13 **and** No

Strand (iii)
Supporting answers with explanation and evidence
Must have scored M1

Q1 ft

Alternative method

Can swim:

$\frac{24}{40}$ *oe*   or 60% or 0.6

Proportions in the same format

eg 60% **and** 66.(...)% or 67%

or 0.6 **and** 0.66(…) or 0.67

or two comparable fractions

equivalent to $\frac{24}{40}$ **and** $\frac{2}{3}$

eg $\frac{72}{120}$ **and** $\frac{80}{120}$

1

or $\frac{9}{15}$ **and** $\frac{10}{15}$

Cannot swim:

$\frac{16}{40}$ *oe or 40% or 0.4*

M1

Proportions in the same format
*eg 40% **and** 33.(…)%*
*or 0.4 **and** 0.33(…)*
or two comparable fractions
equivalent to $\frac{16}{40}$ *and* $\frac{1}{3}$

eg $\frac{48}{120}$ *and* $\frac{40}{120}$

or $\frac{6}{15}$ *and* $\frac{5}{15}$

A1

their two comparable proportions

and No

Strand (iii)
Supporting answers with explanation and evidence

Q1 ft

(b)   A valid suggestion for improvement

eg ask people not at leisure centre *oe*
Condone ask more / bigger sample

B1

[4]

M14.   (a)   (i)   White or W

B1

(ii) $\frac{1}{4}$ or (0).25 or 25%

B1 sight of $\frac{1}{8}$ *or* $\frac{25}{100}$
B1 1 out of 4 or 1 in 4

B2

(b)   All labelled red or R

B1

(c)   1 white, 1 green, 4 red, 4 blue
         B1   all four colours used and 2 of other 3 criteria met
         eg 2W 2G 3R 3B

B2

[6]

M15.   (a)   (i)   0.9
                  oe

B1

        (ii)   (10, 0.9) plotted

                 $\pm \dfrac{1}{2}$ *square*
                 ft their 0.9

B1 ft

(b) $0.55 \times 20 \, (-9)$ or $11 \, (-9)$
           oe

M1

    2

A1

(c) $0.6 \times 130 \, (= 78)$
        oe   60 + 0.6 × 30
        Must use 0.6

M1

   78 and no
        Yes as 78 is nearly 80 oe

A1

Alternative method 1

$$\frac{80}{130} \, (\times 100)$$

M1

0.61… or 0.62 **and** 0.6 and No61.(…) or 62 **and** 60 and No

Yes as 60 is nearly 61.(…) or 62
Yes as 0.6 is nearly 0.61 (…) or 0.62
Must use 0.6 or 60

A1

Alternative method 2

Full explanation that you cannot tell because the sample size
is only one packet

oe

B2

[6]

$$\frac{80}{130} \, (\times 100)$$