01. 0580_m24_ms_22 Q: 12

	14	**1**	

02. 0580_m24_ms_22 Q: 25

	$\frac{2}{3}$ oe nfww	**4**	**M3** for $\frac{2}{13}\times\frac{11}{12}+\frac{5}{13}\times\frac{8}{12}+\frac{6}{13}\times\frac{7}{12}$ oe or $1-\left(\frac{2}{13}\times\frac{1}{12}+\frac{5}{13}\times\frac{4}{12}+\frac{6}{13}\times\frac{5}{12}\right)$oe or **M2** for sum of three or more correct product pairs and no incorrect pairs or for $\frac{2}{13}\times\frac{1}{12}+\frac{5}{13}\times\frac{4}{12}+\frac{6}{13}\times\frac{5}{12}$ and no other pairs or **M1** for $\frac{j}{13}\times\frac{k}{12}$ If 0 scored **SC1** for answer $\frac{104}{169}$ oe

03. 0580_s24_ms_21 Q: 2

(a)	0.4 oe	**1**	
(b)	42 0.2 0.2	**2**	**B1** for 42 **B1** for 0.2 and 0.2 If B0 scored **SC1** for *their* two probabilities being half *their* **(a)**

04. 0580_s24_ms_21 Q: 22

	0.225 oe	**4**	**M3** for $\left(1-\frac{0.25}{0.4}\right)\times(1-0.4)$ oe OR **M2** for $\frac{0.25}{0.4}$ or **M1** for $0.4\times p = 0.25$ oe **M1** for (1 – *their*P(Jen red))×(1 – 0.4) oe

05. 0580_s24_ms_22 Q: 23

(a)	15	**1**	
(b)	$\frac{1}{2}$ oe nfww	**2**	**M1** for $\frac{2+3}{2+1+3+4}$ oe or $1-\frac{4+1}{2+1+3+4}$ oe with either the numerator or denominator correct

06. 0580_s24_ms_23 Q: 5

	0.85 oe	**1**	

07. 0580_m23_ms_22 Q: 24

24	7	**2**	**B1** for answer 6 or **M1** for $\left(\frac{2}{3}\right)^{k}\left(\frac{1}{3}\right)$ shown with $k > 1$ or $\left(\frac{2}{3}\right)^{an+b}\left(\frac{1}{3}\right)=\frac{64}{2187}$ oe or for $3^{n} = 2187$ soi or $2^{n-1} = 64$ or $3^{n-1} = 729$ or better

08. 0580_s23_ms_21 Q: 5

Question	Answer	Marks	Partial Marks
	0.22 oe	**2**	**M1** for 1 – (0.3 + 0.35 + 0.13) oe or B1 for 0.78 oe

09. 0580_s23_ms_21 Q: 15

Question	Answer	Marks	Partial Marks
	$\frac{20}{39}$ oe	**3**	**M2** for $\frac{5}{13}\times\frac{8}{12}[\times 2]$ oe or **M1** for $\frac{5}{13}$ or $\frac{8}{12}$ or $\frac{5}{12}$ or $\frac{8}{13}$ If 0 scored **SC1** for answer $\frac{80}{169}$ oe

10. 0580_s23_ms_22 Q: 5

Question	Answer	Marks	Partial Marks
	0.4 oe	**2**	**M1** for 1 – (0.2 + 0.05 + 0.35) oe or **B1** for 0.6 oe

11. 0580_s23_ms_22 Q: 23

Question	Answer	Marks	Partial Marks
	$\frac{1}{3}$ oe	**3**	**M1** for $\left(1-\frac{2}{5}\right)\times p=\frac{1}{10}$ oe **M1** for $\frac{2}{5}\times(1-\textit{their } p)$ where $0 < \textit{their } p < 1$

12. 0580_s23_ms_23 Q: 7

Question	Answer	Marks	Partial Marks
(a)	0.11 oe	2	**M1** for 1 – (0.3 + 0.16 + 0.18 + 0.25) oe or **B1** for 0.89 oe
(b)	0.46 oe	2	**M1** for 0.3 + 0.16

13. 0580_w23_ms_23 Q: 6

Question	Answer	Marks	Partial Marks
(a)	0.11 oe	2	**M1** for 1 – (0.4 + 0.32 + 0.17) oe
(b)	576	1	

14. 0580_s22_ms_22 Q: 6

Question	Answer	Marks	Partial Marks
	0.48 oe	2	**M1** for $1-(0.2+0.32)$ oe

15. 0580_s22_ms_22 Q: 16

Question	Answer	Marks	Partial Marks
(a)	$(M \cup G) \cap P'$	1	
(b)	22	1	
(c)	$\frac{8}{23}$ oe	2	**M1** for $\frac{k}{23}$ or $\frac{k}{3+9+5+6}$ or $\frac{8}{c}$ or $\frac{3+5}{c}$ $c \neq 1$ or for 8 and 23 identified

16. 0580_s22_ms_23 Q: 1

Question	Answer	Marks	Partial Marks
	0.95 oe	**1**	

17. 0580_w22_ms_21 Q: 25

Question	Answer	Marks	Partial Marks
(a)(i)	$\frac{3}{4}$ oe	**1**	
(a)(ii)	45	**1**	**FT** 60 × *their* **(a)(i)** correctly evaluated
(b)	$\frac{47}{66}$ oe	**4**	**M3** for $1-\left(\frac{5}{12}\times\frac{4}{11}+\frac{4}{12}\times\frac{3}{11}+\frac{3}{12}\times\frac{2}{11}\right)$ oe or **M2** for $\left(\frac{5}{12}\times\frac{4}{11}+\frac{4}{12}\times\frac{3}{11}+\frac{3}{12}\times\frac{2}{11}\right)$ oe or $\left(\frac{5}{12}\times\frac{4}{11}+\frac{5}{12}\times\frac{3}{11}+\frac{4}{12}\times\frac{3}{11}\right)$ oe or **M1** for $\frac{5}{12}\times\frac{4}{11}$ or $\frac{5}{12}\times\frac{3}{11}$ or $\frac{4}{12}\times\frac{3}{11}$ or $\frac{3}{12}\times\frac{2}{11}$ oe If 0 scored, **SC1** for $\frac{47}{72}$ oe

Question	Answer	Marks	Partial Marks
(c)	5	**2**	**M1** for correct trial to at least two balls one of which is not green

18. 0580_w22_ms_22 Q: 19

Question	Answer	Marks	Partial Marks
	$\frac{3}{7}$ oe	3	**M1** for clearly identifying the 7 even outcomes 2 6, 3 5, 3 7, 3 9, 5 5, 5 7, 5 9 **M1** for clearly identifying the 3 even outcomes with just one five 3 5, 5 7 and 5 9 If 0 scored **SC1** for answer $\frac{1}{4}$ oe

19. 0580_w22_ms_23 Q: 6

Question	Answer	Marks	Partial Marks
(a)	$\frac{7}{20}$ oe or 0.35 or 35%	2	**M1** for $1-\left(\frac{2}{5}+\frac{1}{4}\right)$ oe
(b)	48	1	

20. 0580_s21_ms_21 Q: 17

Question	Answer	Marks	Partial Marks
	$\frac{19}{60}$ oe	3	**M2** for $\frac{8}{16}\times\frac{7}{15}+\frac{5}{16}\times\frac{4}{15}$ or **M1** for $\frac{8}{16}\times\frac{7}{15}$ or $\frac{5}{16}\times\frac{4}{15}$ If 0 scored **SC1** for $\frac{89}{256}$ oe

21. 0580_s21_ms_22 Q: 1

Question	Answer	Marks	Partial Marks
(a)	$\frac{3}{10}$ oe	1	
(b)	35	1	

22. 0580_s21_ms_23 Q: 26

Question	Answer	Marks	Partial Marks
	0.845 oe	**3**	**M2** for $0.7 \times 0.95 + (1 - 0.7) \times 0.6$ oe or **M1** for one of these products

23. 0580_w21_ms_22 Q: 7

Question	Answer	Marks	Partial Marks
	$\frac{37}{60}$ oe	**4**	**B3** for $x = 18$ or 37 [yellow] or **SC2** for answer $\frac{5}{12}$ or **M2** for $\frac{1}{12} = \frac{5}{5+x+2x+1}$ oe or **M1** for $5 + x + 2x + 1$ oe or [total number of flowers =] 60

24. 0580_w21_ms_22 Q: 16

Question	Answer	Marks	Partial Marks
(a)	Multiples of 3 Prime numbers + | 3 | **6** | 9 2 | 5 | **8** | 11 3 | 6 | **9** | **12** **5** | **8** | **11** | **14**	**2**	**B1** for at least 4 correct entries
(b)	$\frac{2}{5}$ oe	**2**	**B2FT** for $\frac{their\ 2}{their\ 5}$ or **B1FT** for $\frac{their\ 2}{k}$ k is any integer in the range $1 \leqslant k \leqslant 7$ or $\frac{c}{their\ 5}$ c is 0, 1 or 2

25. 0580_P20_ms_20 Q: 22

	Answer	Mark	Partial Marks
	$\frac{10}{12}$ oe	3	**M2** for $1-\frac{2}{3}\times\frac{1}{4}$ or for $\frac{1}{3}\times\frac{3}{4}+\frac{1}{3}\times\frac{1}{4}+\frac{2}{3}\times\frac{3}{4}$ or **M1** for $\frac{2}{3}\times\frac{1}{4}$ or for $\frac{1}{3}\times\frac{1}{4}+\frac{2}{3}\times\frac{3}{4}$

26. 0580_s20_ms_21 Q: 4

	Answer	Marks	Partial Marks
(a)	0.22 oe	2	**M1** for 0.15 + 0.2 + ? + 0.43 = 1 or better
(b)	40	1	

27. 0580_s20_ms_23 Q: 5

	Answer	Marks	Partial Marks
	42	2	**M1** for $\frac{7}{15}$ [× 90]

28. 0580_w20_ms_23 Q: 11

Question	Answer	Marks	Partial Marks
(a)	50	2	**M1** for $\frac{5}{7+5+2}$ [× 140] or $\frac{140}{7+5+2}$ [× 5]
(b)	26	2	**M1** for $\frac{5+9}{n}=\frac{2}{7}$ oe or $\frac{5+9}{p+7+5+2+9}=\frac{2}{7}$ oe

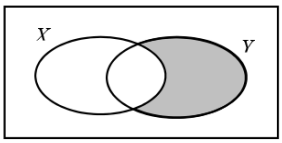
29. 0580_m19_ms_22 Q: 6

	Answer	Mark	Partial Marks
	70	2	**M1** for 25 000 × 0.0028 oe

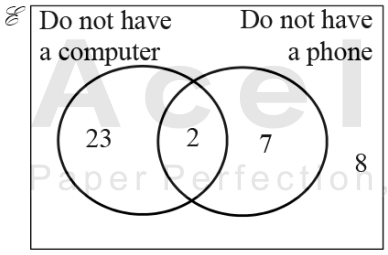
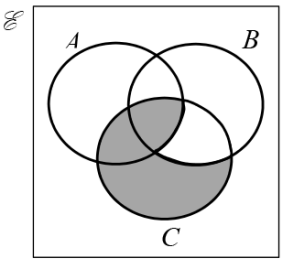
30. 0580_s19_ms_21 Q: 11

	Answer	Mark	Partial Marks
	$\frac{2}{20}$ oe	**2**	**M1** for $\frac{2}{5}\times\frac{1}{4}$ oe

31. 0580_s19_ms_22 Q: 21

	Answer	Mark	Partial Marks
(a)		**1**	
(b)(i)	$\frac{9}{16}$ oe	**2**	**B1** for $\frac{9}{k}$ or $\frac{k}{16}$ provided fraction is less than 1
(b)(ii)	46	**1**	

32. 0580_s19_ms_23 Q: 20

	Answer	Mark	Partial Marks
(a)(i)	$\frac{8}{15}$ oe	**1**	
(a)(ii)		**2**	**B1** for 2 or 3 correct out of 4 regions
(b)		**1**	

33. 0580_w19_ms_21 Q: 20

	Answer	Mark	Partial Marks
	$\frac{147}{160}$ oe	**3**	**M2** for $\frac{1}{10}\times\frac{3}{4}+\frac{9}{10}\times\frac{15}{16}$ or **M1** for $\frac{1}{10}\times\frac{3}{4}$ or $\frac{9}{10}\times\frac{15}{16}$

34. 0580_w19_ms_22 Q: 18

	Answer	Mark	Partial Marks
(a)	0.3 oe	**2**	**M1** for 0.4×0.75
(b)	0.975 oe	**2**	**M1** for $1 - 0.4 \times 0.25 \times 0.25$ oe or $0.6 + 0.4 \times 0.75 + 0.4 \times 0.25 \times 0.75$ or 0.6 + *their* **(a)** $+ 0.4 \times 0.25 \times 0.75$

35. 0580_m18_ms_22 Q: 22

	Answer	Mark	Partial Marks
(a)	$\frac{9}{20}$ oe	**1**	
(b)(i)	$\frac{6}{20}\times\frac{5}{19}$	**M1**	
	$\frac{30}{380}$ oe	**A1**	
(b)(ii)	$\frac{258}{380}$ oe	**4**	**M3** for $1-\frac{3}{38}-\frac{5}{20}\times\frac{4}{19}-\frac{9}{20}\times\frac{8}{19}$ oe or **M2** for $\frac{3}{38}+\frac{5}{20}\times\frac{4}{19}+\frac{9}{20}\times\frac{8}{19}$ oe or $\frac{5}{20}\times\frac{9}{19}+\frac{6}{20}\times\frac{9}{19}+\frac{6}{20}\times\frac{5}{19}$ oe or **M1** for one correct product other than $\frac{6}{20}\times\frac{5}{19}$

36. 0580_s18_ms_21 Q: 20

	Answer	Mark	Partial Marks
(a)	$\frac{8}{15}$ oe	**1**	
(b)	$\frac{168}{210}$ oe	**3**	**M2** for $1-\frac{7}{15}\times\frac{6}{14}$ oe or $3(\frac{7\times8}{15\times14})$ oe or **M1** for $\frac{7}{15}\times\frac{6}{14}$ or $\frac{7}{15}\times\frac{8}{14}$ or $\frac{8}{15}\times\frac{7}{14}$ oe

37. 0580_s18_ms_22 Q: 24

	Answer	Mark	Partial Marks
(a)	$\frac{4}{5}$ oe	**2**	**M1** for $\frac{2}{3}\times p=\frac{8}{15}$ or better
(b)	$\frac{1}{15}$ oe	**3**	**3FT** $(1-\textit{their}\ \frac{4}{5})\times\frac{1}{3}$ correctly evaluated **M2** for $(1-\textit{their}\ \frac{4}{5})\times(1-\frac{2}{3})$ oe or **M1** for $1-\textit{their}\ \frac{4}{5}$ or $1-\frac{2}{3}$

38. 0580_s18_ms_23 Q: 7

	Answer	Mark	Partial Marks
	162	**2**	**M1** for 225 × 0.72 oe

39. 0580_w18_ms_21 Q: 22

	Answer	Mark	Partial Marks
(a)	$\frac{94}{200}$ oe	**2**	**M1** for $\frac{46}{200}+\frac{48}{200}$ oe
(b)	14.1 or 14.07…	**3**	**M2** for $2\left(\frac{50}{200}\times\frac{56}{199}\right)$ oe or **M1** for $\frac{50}{200}\times\frac{56}{199}$ oe

40. 0580_s17_ms_21 Q: 8

	Answer	Mark	Partial Marks
	rt $(1-t)\,r$ $(1-r)t$ oe $(1-r)(1-t)$ oe	3	**B1** for each

41. 0580_s17_ms_21 Q: 20

	Answer	Mark	Partial Marks
(a)	5 7 7 8 10 7 9 9 10 12	1	
(b)	7	1	
(c)(i)	$\frac{7}{25}$ or 0.28 or 28%	2FT	**FT** $\frac{their\ 7}{25}$ **B1** for $\frac{k}{25}$ If zero scored, then **SC1** for $\frac{2}{5}$ or $\frac{6}{15}$ if no values in the bottom two rows of the table.
(c)(ii)	0	1FT	**FT** $\frac{their\ 0}{25}$

42. 0580_s17_ms_22 Q: 2

	Answer	Mark	Partial Marks
	[0].15 oe	1	

43. 0580_s17_ms_23 Q: 6

	Answer	Mark	Partial Marks
	$\frac{4}{25}$ oe	2	**M1** for $\frac{2}{5}\times\frac{2}{5}$ oe or denominator 5^2 oe

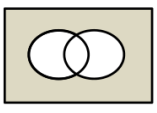
44. 0580_m16_ms_22 Q: 21

	Answer	Mark	Partial Marks
(a)	$\frac{2}{3}$ oe	**1**	
(b)	*their* $\frac{2}{3}$, $\frac{7}{8}$, $\frac{5}{8}$ oe	**2**	**B1** for either $\frac{7}{8}$ or $\frac{5}{8}$
(c) (i)	$\frac{1}{24}$ oe	**2**	**M1** for $\frac{1}{3}\times\frac{1}{8}$ seen
(ii)	$\frac{17}{24}$ oe	**3**	**M2FT** for $\frac{1}{3}\times\frac{7}{8}+\frac{2}{3}\times\frac{5}{8}$ or **M1FT** for $\frac{1}{3}\times\frac{7}{8}$ or $\frac{2}{3}\times\frac{5}{8}$

45. 0580_s16_ms_21 Q: 19

	Answer	Mark	Partial Marks
	$\frac{5}{6}$ oe	**3**	**M2** for $1-\frac{2}{3}\times\frac{1}{4}$ or $\frac{1}{3}+\frac{2}{3}\times\frac{3}{4}$ or $\frac{1}{3}\times\frac{3}{4}+\frac{1}{3}\times\frac{1}{4}+\frac{2}{3}\times\frac{3}{4}$ or **M1** for $\frac{2}{3}\times\frac{1}{4}$ or $\frac{1}{3}\times\frac{1}{4}+\frac{2}{3}\times\frac{3}{4}$

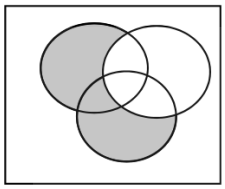
46. 0580_s16_ms_21 Q: 22

	Answer	Mark	Partial Marks
(a)	3	**1**	
(b)	$\frac{19}{27}$ oe	**1**	
(c)	$\frac{7}{10}$ oe	**1**	
(d)		**1**	

47. 0580_s16_ms_23 Q: 11

	Answer	Mark	Partial Marks
(a)	0.6 oe	**1**	
(b)	20 0.3 oe 0.3 oe	**2**	**B1** for 20 **B1** for 0.3 oe and 0.3 oe

48. 0580_w16_ms_22 Q: 15

	Answer	Mark	Partial Marks
(a) (i)	9	**1**	
(ii)	12	**1**	
(b)	$\frac{5}{14}$	**1**	
(c)		**1**	

49. 0580_P15_ms_20 Q: 10

	Answer	Mark	Partial Marks
	0.38 or $\frac{19}{50}$	**4**	**B1** 0.8, 0.6 or 0.55 then **M1** 0.45 × their 0.6 **M1** 0.2 × their 0.55 **or M2** 1 – (0.45 × 0.4 + 0.55 × their 0.8)

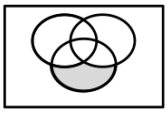
50. 0580_s15_ms_21 Q: 5

	Answer	Mark	Partial Marks
	Sammy and correct reason with 25.7% oe shown	**2**	**B1** for 25.7% or 0.257... seen or conversion of 26% to fraction and common denominator

51. 0580_s15_ms_22 Q: 5

	Answer	Mark	Partial Marks
	0.2 oe	**2**	**M1** for 1 – (0.15 + 0.3 + 0.35)

52. 0580_s15_ms_23 Q: 16

	Answer	Mark	Partial Marks
(a) (i)	14	**2**	**M1** for any two of 1, 11, 14, 4 correctly placed on Venn diagram or for $1+25-x+x+18-x=30$ oe
(ii)	$\frac{11}{30}$ oe	**1FT**	**FT** $\frac{25-\textit{their}\ (\mathbf{a})(\mathbf{i})}{30}$ or $\frac{\textit{their}\ 11}{30}$ from diagram
(iii)	$\frac{11}{12}$ oe	**1FT**	**FT** their diagram e.g. $\frac{\textit{their}\ 11}{12}$ or $\frac{25-\textit{their}\ (\mathbf{a})(\mathbf{i})}{12}$
(b)		**1**	

53. 0580_w15_ms_21 Q: 20

	Answer	Mark	Partial Marks
(a)	0.16 oe	**2**	**M1** for 0.4×0.4 If zero scored **SC1** for fully correct evaluated method involving a without replacement method
(b)	0.58 oe	**4**	**M3** for $1-(0.4^2+0.5^2+0.1^2)$ oe or **M2** for $0.4^2+0.5^2+0.1^2$ ALT method **M3** for $0.4\times(0.5+0.1)+0.5\times(0.4+0.1)+0.1\times(0.4+0.5)$ oe or **M2** for addition of any **three** of: $0.4\times0.5, 0.4\times0.1, 0.5\times0.4, 0.5\times0.1, 0.1\times0.4$ and 0.1×0.5 or **M1** for addition of any **two** of: $0.4\times0.5, 0.4\times0.1, 0.5\times0.4, 0.5\times0.1, 0.1\times0.4$ and 0.1×0.5 If zero scored **SC2** for fully correct evaluated method involving a without replacement method

54. 0580_w15_ms_22 Q: 23

	Answer	Mark	Partial Marks
(a)	$\frac{8}{14}$ and $\frac{5}{13}$	1	
	$\frac{6}{13}$ and $\frac{7}{13}$	1	
(b) (i)	$\frac{30}{182}$ oe	2	**M1FT** for $\frac{6}{14} \times$ *their* $\frac{5}{13}$
(ii)	$\frac{126}{182}$ oe	3	**M2FT** for $1 - \frac{8}{14} \times \frac{7}{13}$ or $\frac{6}{14} \times \frac{5}{13} + \frac{6}{14} \times \frac{8}{13} + \frac{8}{14} \times \frac{6}{13}$ or $\frac{6}{14} + \frac{8}{14} \times \frac{6}{13}$ oe or **M1FT** for sum of any two of $\frac{6}{14} \times \frac{5}{13}$ or $\frac{6}{14} \times \frac{8}{13}$ or $\frac{8}{14} \times \frac{6}{13}$

55. 0580_w15_ms_23 Q: 4

	Answer	Mark	Partial Marks
	6	1	

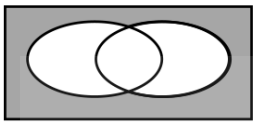
56. 0580_w15_ms_23 Q: 18

	Answer	Mark	Partial Marks
	0.96 oe	3	**M2** for $1 - 0.2 \times 0.2$ or $0.8 + 0.2 \times 0.8$ or $0.8 \times 0.8 + 0.8 \times 0.2 + 0.2 \times 0.8$ or **B1** for one of 0.2×0.2, 0.8×0.8, 0.8×0.2, 0.2×0.8 seen

57. 0580_w14_ms_21 Q: 18

	Answer	Mark	Partial marks
(a)	0.6 0.2 0.8 in correct places	**2**	**B1** for 0.6 in correct place **B1** for 0.2 and 0.8 in correct places
(b)	0.52 oe nfww	**3**	**M2FT** for 1 – (*their* 0.6 × *their* 0.8) oe or **M1FT** for a correct product from *their* tree in **(a)**

58. 0580_s13_ms_21 Q: 12

	Answer	Mark	Partial marks
(a)	$\frac{3}{11}$	**1**	
(b)		**1**	

59. 0580_s13_ms_23 Q: 2

	Answer	Mark	Partial marks
	$\frac{30}{300}$ oe www	**2**	**M1** for 30 seen or $\frac{k}{300}$ seen

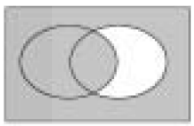
60. 0580_s13_ms_23 Q: 12

	Answer	Mark	Partial marks
(a)	$\frac{5}{25}$ oe	**2**	**B1** for answer $\frac{5}{k}$ or $\frac{k}{25}$
(b)	$\frac{4}{25}$ oe	**2**	**B1** for answer $\frac{4}{k}$ or $\frac{k}{25}$

61. 0580_w13_ms_21 Q: 6

	Answer	Mark	Partial marks
	(a) $\frac{2}{6}$ oe	**1**	
	(b) 200	**1FT**	FT 600 × *their* **(a)** providing *their* **(a)** is a probability

62. 0580_w13_ms_21 Q: 22

	Answer	Mark	Partial marks
	(a) (i) $\frac{5}{50}$ oe	**1**	
	(ii) $\frac{11}{50}$ oe	**1**	
	(b) $\frac{11}{16}$ oe	**1**	
	(c) $\frac{380}{2450}$ oe	**2**	**M1** for $\frac{20}{50}\times\frac{19}{49}$
	(d) 	**1**	

63. 0580_s12_ms_21 Q: 21

	Answer	Mark	Partial marks
(a)	$\frac{1}{12}$	**2**	**M1** $\frac{3}{3+2+4}\times\frac{2}{(their\ 9)-1}$
(b)	$\frac{5}{18}$	**3**	**M2** $their(a)+\frac{4\times3}{their\,72}+\frac{2(\times1)}{their\,72}$ **or M1** $\frac{4\times3}{their\,72}$ or $\frac{2(\times1)}{their\,72}$
(c)	$\frac{5}{9}$	**3**	**M2** $2\times\frac{4}{3+2+4}\times\frac{5}{(their 9)-1}$ **or M1** $\frac{4}{3+2+4}\times\frac{5}{(their 9)-1}$