

Chapter 9 Probability: Assignment

Student name:

- 1** A group of 200 Year 11 students at Bayview Secondary College were asked to indicate their subject choices for Year 12. It was found that 135 chose a mathematics subject (M), 84 chose a language (L), and 55 chose both mathematics and a language.

- a** Draw a Venn diagram to show this situation, and use the diagram to determine the number of students who chose either a language or mathematics or both. Hence find $\Pr(M \cup L)$.
- b** From the Venn diagram write down the following probabilities:
- $\Pr(M)$
 - $\Pr(L)$
 - $\Pr(M \cap L)$
- c** Use the addition rule to determine the value of $\Pr(M \cup L)$.
- d** Use the information in this question to complete the following Karnaugh map:

	L	L'	
M			
M'			
			1

- 2** Another group of 100 Year 11 students at Mountainview Secondary College were also asked to indicate their subject choices for Year 12. Here it was found that 75 chose a mathematics subject (M), 44 chose a language (L), and 25 chose both mathematics and a language.

- a** Use the information in this question to complete the following Karnaugh map.

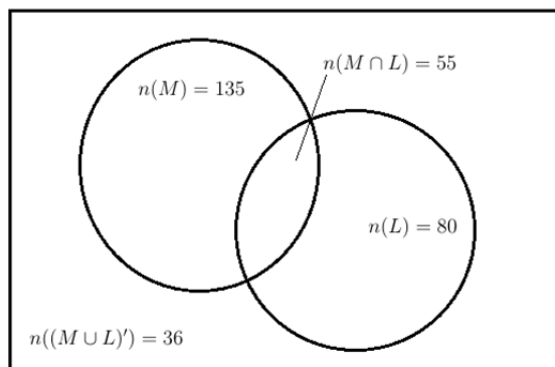
	L	L'	
M			
M'			
			1

- b** Use the Karnaugh map from part **a** to determine:
- the probability that a student chose mathematics and did not choose a language
 - the probability that a student chose neither mathematics nor a language.
- 3** Bayview and Mountainview Secondary Colleges decide to amalgamate. Find the probability that a student at the combined school chose mathematics.

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Answers

1 a



$$n(M \cup L) = 164 \quad \Pr(M \cup L) = \frac{41}{50} = 0.82$$

b **i** $\frac{27}{40} = 0.675$ **ii** $\frac{21}{50} = 0.42$ **iii** $\frac{11}{40} = 0.275$

c $\Pr(M \cup L) = 0.675 + 0.42 - 0.275 = 0.82$, as before

d

	<i>L</i>	<i>L'</i>	
<i>M</i>	0.275	0.40	0.675
<i>M'</i>	0.145	0.18	0.325
	0.42	0.58	1

2 a

	<i>L</i>	<i>L'</i>	
<i>M</i>	0.25	0.5	0.75
<i>M'</i>	0.19	0.06	0.25
	0.44	0.56	1

b **i** 0.5 **ii** 0.06

3 0.7