

REV-PROB-2223-ASM-SET 2-MATH

建議題解

結構式試題

1. (a) 方法數目 = $7!$
 $= 5040$ 1A
- (b) 所求概率 = $\frac{6!2!}{7!}$ 1M
 $= \frac{2}{7}$ 1A
- (c) 所求概率 = $\frac{4!2!2!2!}{7!}$ 1M
 $= \frac{4}{105}$ 1A
2. (a) 所求概率 = $\frac{C_5^6}{C_5^8}$ 2M
 $= \frac{3}{28}$ 1A
- (b) 所求概率 = $\frac{C_1^2 C_4^6}{C_5^8}$ 2M
 $= \frac{15}{28}$ 1A
3. (a) 所求概率 = $\frac{C_2^{12} C_3^8}{C_5^{12+8}}$
 $= \frac{77}{323}$ 1A
- (b) 所求概率 = $\frac{C_3^{12} C_3^8 + C_2^{12} C_4^8 + C_1^{12} C_5^8 + C_6^8}{C_6^{20}}$ 1M
 $= \frac{147}{323}$ 1A
4. (a) 所求概率 = $\frac{C_3^5 + C_3^7}{C_3^{12}}$ 1M
 $= \frac{9}{44}$ 1A
- (b) 所求概率 = $\frac{(C_2^5 2!) C_1^7 + (C_2^7 2!) C_1^5}{C_3^{12} 3!}$ 1M
 $= \frac{35}{132}$ 1A
5. (a) 所求概率 = $\frac{C_5^{10}}{C_5^{16}}$ 1M
 $= \frac{3}{52}$ 1A
- (b) 所求概率 = $1 - \frac{C_5^{10} + C_4^{10} C_1^6}{C_5^{16}}$ 1M
 $= \frac{17}{26}$ 1A

6. (a) 共有 15 名學生。

$$\begin{aligned}\text{方法數目} &= C_3^{15} C_4^{12} C_8^8 & 1\text{M}+1\text{A} \\ &= 225 \times 225 & 1\text{A}\end{aligned}$$

$$(b) \quad (i) \text{ 所求概率} = \frac{C_0^{12} C_4^{12} C_8^8 + C_3^{12} C_1^9 C_8^8 + C_3^{12} C_4^9 C_5^5}{225 \times 225} \quad 1\text{M}$$

$$= \frac{61}{455} \quad 1\text{A}$$

$$(ii) \text{ 所求概率} = 1 - \frac{61}{455} \quad 1\text{M}$$

$$= \frac{394}{455} \quad 1\text{A}$$

$$7. \quad (a) \text{ 所求概率} = \frac{1}{2} \quad 1\text{A}$$

$$(b) \text{ 所求概率} = 1 - \left(\frac{1}{2} \times \frac{1}{2} \right) \quad 1\text{M}$$

$$= \frac{3}{4} \quad 1\text{A}$$

$$8. \quad (a) \text{ 所求概率} = \frac{C_3^8 C_1^4}{C_4^{12}} \quad 1\text{M}$$

$$= \frac{224}{495} \quad 1\text{A}$$

$$(b) \text{ 所求概率} = \frac{C_4^8}{C_4^{12}} + \frac{224}{495} \quad 1\text{M}$$

$$= \frac{98}{165} \quad 1\text{A}$$

$$9. \quad (a) \text{ 所求概率} = \frac{5!7!}{11!} \quad 1\text{M}$$

$$= \frac{1}{66} \quad 1\text{A}$$

$$(b) \text{ 所求概率} = \frac{2!7!4!}{11!} \quad 1\text{M}$$

$$= \frac{1}{165} \quad 1\text{A}$$

$$10. \quad (a) \text{ 方法數目} = C_2^6 = 15 \quad 1\text{A}$$

$$(b) \text{ 所求概率} = 1 - \frac{15}{C_4^{12}} \quad 1\text{M}$$

$$= \frac{32}{33} \quad 1\text{A}$$

11. (a) 所求概率 = $\frac{2+2}{4 \times 4}$ 1M
 $= \frac{1}{4}$ 1A
- (b) 所求概率 = $\frac{3+3}{4 \times 4}$ 1M
 $= \frac{3}{8}$ 1A
- (c) 所求概率 = $1 - \left(\frac{3}{4}\right)\left(\frac{3}{4}\right)$ 1M
 $= \frac{7}{16}$ 1A
12. 所求概率 = $\frac{C_4^6 4! 5!}{9!}$ 1M+1M
 $= \frac{5}{42}$ 1A
13. (a) 所求概率 = $\frac{C_2^2 \times C_2^4 + C_2^4 \times C_2^2}{C_2^7 \times C_2^8}$ 1M+1A
 $= \frac{1}{49}$ 1A
- (b) 所求概率 = $\frac{C_2^4 \times C_1^2 \times C_1^6 + C_1^4 \times C_1^3 \times C_2^2}{C_2^7 \times C_2^8}$ 1M+1A
 $= \frac{1}{7}$ 1A
14. (a) 所求概率 = $\frac{C_5^7 + C_5^5}{C_5^{15}}$ 1M
 $= \frac{2}{273}$ 1A
- (b) 所求之值
 $= 100 \times \frac{2}{273} + 50 \times \frac{C_4^7 C_1^8 + C_4^5 C_1^{10}}{C_5^{15}} + 10 \times \left(1 - \frac{2}{273} - \frac{C_4^7 C_1^8 + C_4^5 C_1^{10}}{C_5^{15}}\right)$ 1M+1A
 $= \$ \frac{1370}{91}$ 1A