

Name: \_\_\_\_\_

Show work needed to justify your answer.

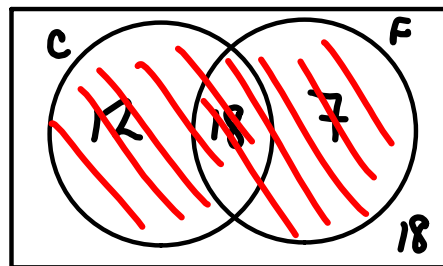
Date: \_\_\_\_\_

HW: # 32a: Math IBSL - Standard 30 - Theoretical and Experimental Probability

5 points

- 2 In a group of 55 tourists, 30 have cameras, 25 are female and 18 are females with cameras. Find the probability that a tourist picked at random from this group is either a camera owner or a female.

$$P(C \cup F) = \frac{37}{55}$$



- 3 A letter is chosen at random from the 26-letter English alphabet. Find the probability that the letter is:

a in the word MATHEMATICS

b in the word TRIGONOMETRY

c in the word MATHEMATICS and in the word TRIGONOMETRY

d in the word MATHEMATICS or in the word TRIGONOMETRY.

$$a) P(\text{MATHEMATICS}) = \frac{8}{26}$$

$$b) P(\text{TRIGONOMETRY}) = \frac{9}{26}$$

$$c) P(a \cap b) = \frac{4}{26}$$

$$d) P(a \cup b) = \left( \frac{8}{26} + \frac{9}{26} \right) - \frac{4}{26} = \boxed{\frac{13}{26}}$$

- 5 If  $X$  and  $Y$  are two events such that  $P(X) = \frac{1}{4}$  and  $P(Y) = \frac{1}{8}$  and  $P(X \cap Y) = \frac{1}{8}$ , find: **ADDITION RULE**

a  $P(X \cup Y)$

b  $P(X \cup Y)'$

$$a) P(X \cup Y) = P(X) + P(Y) - P(X \cap Y)$$

$$= \frac{1}{4} + \frac{1}{8} - \frac{1}{8}$$

$$= \boxed{\frac{1}{4}}$$

$$b) P(X \cup Y)' = \frac{3}{4}$$

- 7  $A$  and  $B$  are two events such that  $P(A) = \frac{3}{16}$  and  $P(B) = \frac{3}{8}$  and it is known that  $P(A \cup B) = 3P(A \cap B)$ .

$$P(B)' = \frac{5}{8}$$

Find:

a  $P(A \cup B)$     b  $P(A \cup B)'$     c  $P(A \cap B)'$

$$3P(A \cap B) = \frac{3}{16} + \frac{3}{8} - P(A \cap B)$$

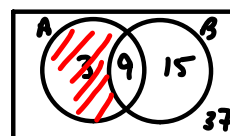
$$+ P(A \cap B) = \frac{9}{16}$$

$$P(A \cap B) = \frac{9}{64}$$

$$a) P(A \cup B) = \frac{12}{64} + \frac{24}{64} - \frac{9}{64} = \boxed{\frac{27}{64}}$$

$$b) P(A \cup B)' = \frac{64}{64} - \frac{27}{64} = \boxed{\frac{37}{64}}$$

$$c) P(A \cap B)' = \boxed{\frac{55}{64}}$$



$$P(B)' = \frac{49}{64}$$