

AND \Rightarrow multiply probabilities
 OR \Rightarrow add probabilities Page | 23

Example 5

A single card is drawn from a stack of 16 cards. In this stack of cards, half of the cards are blue and half 1-8 of the cards are yellow. The blue cards are numbered 1 through 8 and the yellow cards are also numbered 1 through 8.

- a) Are drawing a 4 and drawing a 7 (no overlap mutually exclusive events) or non-mutually exclusive events? Justify your answer.
- b) Determine the probability that the card drawn shows a 4 or a 7, by examining the sample space.
- c) Determine the probability that the card drawn shows a 4 or a 7, using a Venn diagram to arrive at your answer.

a) There is overlap so not mutually exclusive.
 2 cards have the same number.

B = Blue card
 Y = yellow card

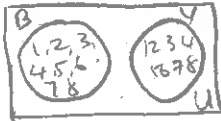
b) B1, B2, B3, (B4), B5, B6, (B7), B8
 Y1, Y2, Y3, (Y4), Y5, Y6, (Y7), Y8 = $\frac{4}{16}$

$$P(4 \text{ or } 7) = \frac{4}{16}$$

P(A) = Blue
 P(A) = Yellow

$$P(A \text{ or } B) = P(A) + P(B) - P(A \cap B)$$

$$= \frac{2}{16} + \frac{2}{16} - \frac{0}{16} = \frac{4}{16}$$



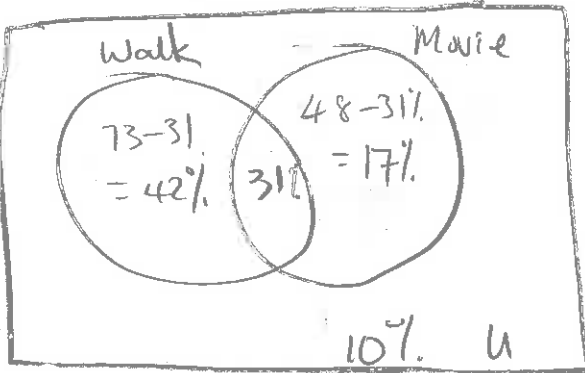
Example 6

On any given night, the probability of Deng going for a walk is 73%. The probability of Deng watching re-runs of the show 'The Good Wife' on Netflix on the same night is 48%. The probability that Deng will do neither activity is 10%.

- a) Determine the probability that Deng will go for a walk and watch 'The Good Wife' on Netflix on any given night.
- b) Determine the probability on any given night of Deng going for a walk or watching 'The Good Wife' on Netflix.

a) use Venn diagram \Rightarrow Walk and Movie = 90%, since 10% did neither so to that walk and watch is:

$$(73 + 48) - 90 = 31\%$$



$$b) P(\text{Walk or Movie}) = P(A) + P(B) - P(A \cap B)$$

$$= 73 + 48 - 31$$

$$= 90\%$$