

Question 1

- (i) Complete the table below to show all of the possible outcomes. Two outcomes have already been filled in for you.

<i>HHH</i>	<i>THH</i>
<i>HHT</i>	<i>THT</i>
<i>HTH</i>	<i>TTH</i>
<i>HTT</i>	<i>TTT</i>

- (ii) Find the probability of getting two heads and one tail.

$$\Pr(2 H, 1 T) = \frac{3}{8}$$

- (iii) Jamie says: “You have the same probability of getting three heads as you do of getting two heads and one tail.”

Do you agree with Jamie? Give a reason for your answer.

Answer: No

Reason: $\Pr(3 H) = \frac{1}{8}$ but $\Pr(2 H, 1 T) = \frac{3}{8}$

Or:

Reason: There is only 1 way to get three heads. There are 3 ways to get two heads and one tail.

- (iv) Max says: “You have the same probability of getting *HHH* as you do of getting *HTH*.”

Do you agree with Max? Give a reason for your answer.

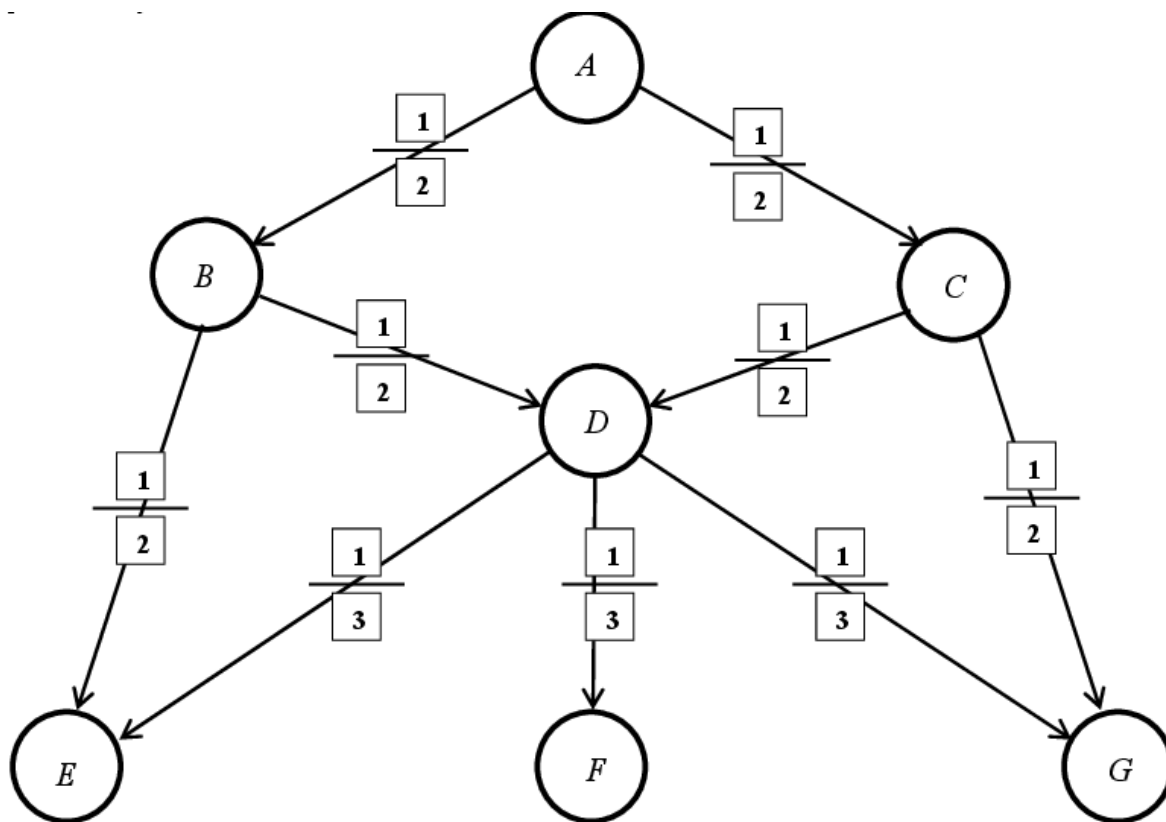
Answer: Yes

Reason: $\Pr(H H H) = \frac{1}{8}$ and $\Pr(H T H) = \frac{1}{8}$

Or:

Reason: There is only one way to get each event.

Question 2



(b) (i) If the skier starts at point A , in how many different ways can the skier reach the point E ?

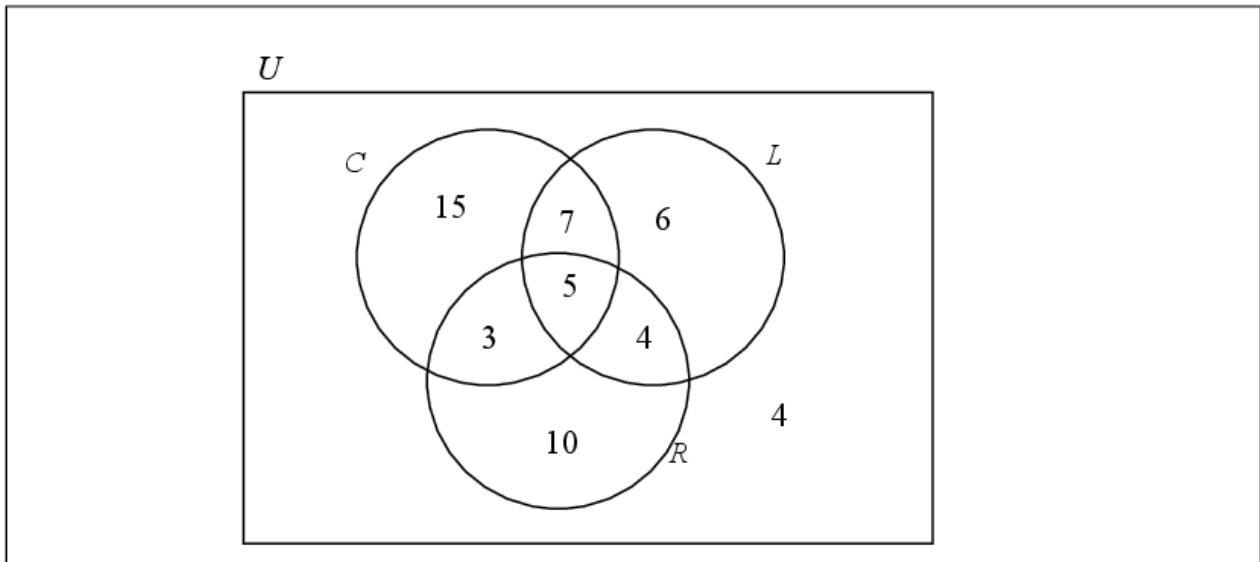
<ol style="list-style-type: none"> 1. $A \rightarrow B \rightarrow E$ 2. $A \rightarrow B \rightarrow D \rightarrow E$ 3. $A \rightarrow C \rightarrow D \rightarrow E$ 	}	3 ways
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(ii) If the skier starts at point A , find the probability that the skier will reach the point E .

<ol style="list-style-type: none"> 1. $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ 2. $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{3} = \frac{1}{12}$ 3. $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{3} = \frac{1}{12}$ 	}	Probability = $\frac{1}{4} + \frac{1}{12} + \frac{1}{12}$ = $\frac{5}{12}$
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Question 3

- (a) Represent the information in a Venn diagram.



- (b) If one person is chosen at random, what is the probability that the person chosen did not vote in any of the three elections?

$$\text{Probability person did not vote} = \frac{4}{54} \text{ or } \frac{2}{27}$$

- (c) If one person is chosen at random, what is the probability that the person chosen voted for at least two different parties?

$$\text{Probability person voted for at least two parties} = \frac{3+5+7+4}{54} = \frac{19}{54}$$

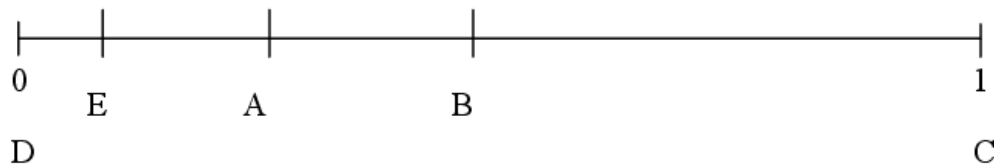
- (d) If one person is chosen at random, what is the probability that the person chosen voted for the same party in all three elections?

$$\text{Probability person voted for the same party} = \frac{15+6+10}{54} = \frac{31}{54}$$

Question 4

Event		Probability
A club is selected in a random draw from a pack of playing cards	A	$\frac{1}{4}$
A tossed fair coin shows a tail on landing	B	$\frac{1}{2}$ OR evens OR 50/50
The sun will rise in the east tomorrow	C	1 OR certain
May will follow directly after June	D	0 OR impossible
A randomly selected person was born on a Thursday	E	$\frac{1}{7}$

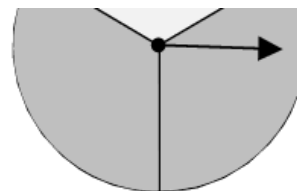
(b) Place each of the letters A, B, C, D and E at its correct position on the probability scale below.



Question 5

(a) What is the probability of the spinner landing on a blue sector?

$\frac{2}{3}$ or $\frac{240}{360}$



(b) Find the probability of getting a head and a red.

$\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$
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(c) Find the probability of getting a tail and a blue.

$\frac{1}{2} \times \frac{2}{3} = \frac{1}{3}$
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Question 6

	$\frac{1}{6}$				
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A fair die is tossed 500 times.
The results are partially recorded in the table below.

Number on die	1	2	3	4	5	6
Frequency	70	82	86	90	91	81
Relative Frequency	.14	.16	.17	.18	.18	.16



(b) Calculate the number of times a 3 appeared. Write your answer in the table above.

	$500 - (70+82+90+91+81)$ 86				
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(c) Calculate the relative frequency of each outcome and write it into the table above.
Give your answers correct to 2 decimal places.

	$\frac{70}{500} = 0.14$ $\frac{82}{500} = 0.16$ $\frac{86}{500} = 0.17$	$\frac{90}{500} = 0.18$ $\frac{91}{500} = 0.18$ $\frac{81}{500} = 0.16$			
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(d) Give a possible reason for the difference in value between the relative frequency for 1 in the table and your answer to part (a).

	$0.166 \text{ V } 0.14$ $\text{Experimental error}$				
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