(a) (i) Find the number of different arrangements that can be made using all the letters of the word RAINBOW. Each letter is used only once.

(ii) Find the number of different 3-letter arrangements that can be made using the letters of the word RAINBOW. Each letter is used at most once.

(b) A game, called Rainbow, uses an unbiased circular spinner.

The spinner has seven sectors coloured red $(R)$, orange $(O)$, yellow $(Y)$, green $(G)$, blue $(B)$, indigo ( I ), and violet ( V ) as shown below.
The table below shows the angle of each sector.
It also shows the cash prize that a player wins if the spinner stops in that sector.

| Colour | Angle | Probability | Prize |
| :---: | :---: | :---: | :---: |
| Red | $72^{\circ}$ |  | $€ 20$ |
| Orange | $30^{\circ}$ |  | $€ 60$ |
| Yellow | $45^{\circ}$ | $\frac{1}{8}$ | $€ 24$ |
| Green | $90^{\circ}$ |  | $€ 8$ |
| Blue | $60^{\circ}$ |  | $€ 42$ |
| Indigo | $18^{\circ}$ |  | $€ 90$ |
| Violet | $45^{\circ}$ |  | $€ 48$ |


(i) Complete the "Probability" column of the table which shows the probability of the spinner coming to rest in each sector after one spin.
(ii) Find the expected value of the prize that a player wins if they play Rainbow.


