

Lesson 2

GCSE Mathematics Probability

2.1 Percentage Probabilities

Suppose that we have the integers from 1 to 10 written on cards.



The cards are shuffled, face down, and one chosen at random.

State the percentage probability that the number on the card chosen is;

(i) 3

[1 mark]

(ii) Even

[1 mark]

(iii) A factor of 4

[1 mark]

(iv) Prime

[1 mark]

(v) A triangular number

[1 mark]

(vi) A multiple of 1

[1 mark]

2.2 Conversion Table : Vulgar Fractions \Leftrightarrow Percentages

Here is a handy table that converts between vulgar fractions and percentages.

At the left hand end, for example, notice that a vulgar fraction probability of

$\frac{1}{100}$ is equivalent to a percentage probability of 1%

$\frac{1}{100}$	$\frac{1}{50}$	$\frac{1}{25}$	$\frac{1}{20}$	$\frac{1}{16}$	$\frac{1}{10}$	$\frac{1}{8}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$
1%	2%	4%	5%	6.25%	10%	12.5%	20%	25%	$33\frac{1}{3}\%$	50%

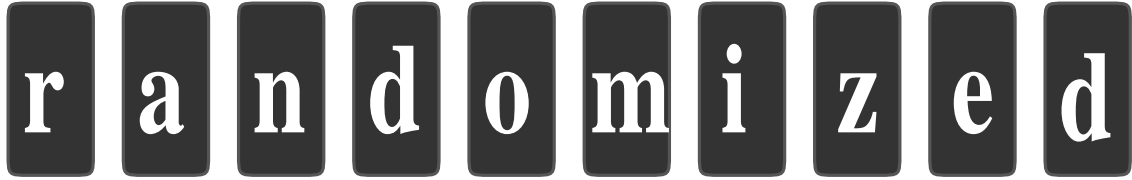
2.3 Exercise

**** Non-Calculator ****

Marks Available : 40

Question 1

Ten letter cards are placed face up on a table.



They are turned face down and randomly moved around the table.

One is then turned face up.

State the percentage probability that the face up card is;

(i) z

[1 mark]

(ii) d

[1 mark]

(iii) a vowel

[1 mark]

Question 2

Given that $\frac{1}{20} = 5\%$, write the following as percentages;

(i) $\frac{3}{20}$

[1 mark]

(ii) $\frac{11}{20}$

[1 mark]

(iii) $\frac{9}{20}$

[1 mark]

(iv) $\frac{19}{20}$

Hint: $\frac{19}{20} = 1 - \frac{1}{20}$

[2 marks]

Question 3

What is the percentage probability of a spun fair coin landing 'tails' ?

[1 mark]

Question 4

Five cards are placed face up on a table.

On their faces are printed the numbers 4, 12, 9, 11, 15.



The cards are turned face down and randomly moved around the table.

One is then turned face up.

State the percentage probability that the face up card is;

(i) Even

[1 mark]

(ii) Odd

[1 mark]

(iii) Divisible by 3

[1 mark]

(iv) Divisible by 4

[1 mark]

(v) Square

[1 mark]

(vi) Prime

[1 mark]

Question 5

Twenty-five of the first one hundred integers are prime numbers.

If an integer between 1 and one hundred (inclusive) is chosen at random, what is the percentage probability of it **NOT** being prime.

[1 mark]

Question 6

Explain what is wrong with the following statement;

The probability that it will rain tomorrow is 120%.

[1 mark]

Question 7

An octahedral die has its faces numbered 1, 2, 3, 4, 5, 6, 7 and 8.
It is to be rolled once.

Giving your answers as percentages, what is,

(i) p (square number)

[1 mark]

(ii) p (triangular number)

[1 mark]

(iii) p (prime number)

[1 mark]

Question 8

Given that $4\% = \frac{1}{25}$ write the following percentage probabilities as vulgar fractions.

(i) 8%

(ii) 24%

(iii) 32%

(iv) 96% Hint : $96\% = 100\% - 4\%$

[4 marks]

Question 9

Write the following vulgar fraction probabilities as percentage probabilities.

(i) $\frac{2}{5}$

Hint : $\frac{1}{5} = 20\%$

[1 mark]

(ii) $\frac{7}{50}$

Hint : $\frac{1}{50} = 2\%$

[1 mark]

(iii) $\frac{3}{20}$

Hint : $\frac{1}{20} = 5\%$

[1 mark]

(iv) $\frac{4}{25}$

Hint : $\frac{1}{25} = 4\%$

[1 mark]

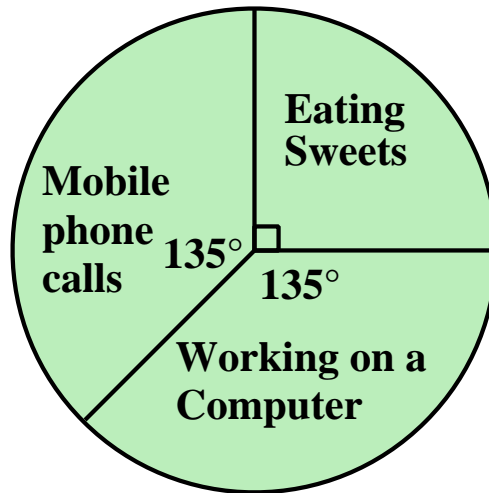
Use your answers to put the four vulgar fraction probabilities in order.

Write your list smallest to biggest.

[2 marks]

Question 10

The pie chart shows the main activity of a school of pupils during a morning break.



If a pupil was to be selected at random what is the percentage probability that their main activity during break was;

(i) Eating sweets

[2 marks]

(ii) Working on a computer

[2 marks]

(iii) Making mobile phone calls ?

[2 marks]

Question 11

If the probability of a certain traffic light being green when I arrive is 37%, what is the probability of it **NOT** being green ?

[1 mark]

Question 12

The probability that a climber will die attempting the summit of Mount Everest is one person in six. As of July 2019, approximately 1842 people have attempted to climb the mountain.

How many does this suggest have died during their attempt ?

[3 marks]