Maths in Psychology

Bridging Work 2020

Introduction:

In Psychology about 10% of the marks available are maths skills – in terms of overall marks this equates to about a grade. The Maths skills are an equivalent level to that of Higher GCSE Maths/Stats– this booklet is to help you become more familiar with some of the mathematical content that you will need to know for the course.

1) Standard form:

Sometimes psychologists will come across very large or very small numbers. Because of the nature of very large numbers, it is often necessary to simplify these using shorthand, this is known as standard form.

Write in standard form

a) 70×10^5

b) 40×10^5

c) 0.8×10^6

d) 0.4×10^8

e) 0.3×10^8

f) 0.7×10^6

g) 150×10^4

h) 480×10^2

i) 0.044×10^5

j) 0.073×10^7

2) Rounding to decimal places

Round to 1 decimal place

a) 0.374

b) 0.798

c) 0.393

d) 0.584

Round to 2 decimal places

e) 0.136

f) 0.138

g) 0.464

Round to three decimal places

h) 29.9757

i) 46.2317

j) 79.0919

Round the numbers in the table.

Number	1 decimal place	2 decimal places
0.181	0.2	k)
8.928	l)	m)
0.4923	n)	o)
45.7053	p)	q)

3) Rounding to significant figures

Round to 1 significant figure

a) 15

b) 983

c) 0.0097

d) 1.9

Round to 2 significant figures

e) 0.133

f) 0.0403

g) 90054

Round to 3 significant figures

h) 0.6402

i) 160.7

Round the numbers in the table.

Number	1 significant figure	2 significant figures	3 significant figures
4.915	5	j)	k)
5253	l)	m)	n)
197.196	o)	p)	q)
0.4063	r)	s)	t)

4) Using percentages, fractions and decimals

Convert to a decimal

a) $\frac{1}{2}$

b) $\frac{3}{40}$

c) 65%

d) 153%

e) 51.6%

f) 41%

Convert to a fraction, reduced to simplest form

g) 0.2

h) 0.62

i) 90%

Convert to a percentage

j) 0.87

k) 2.11

l) 0.017

m) 2.91

n) $\frac{9}{10}$

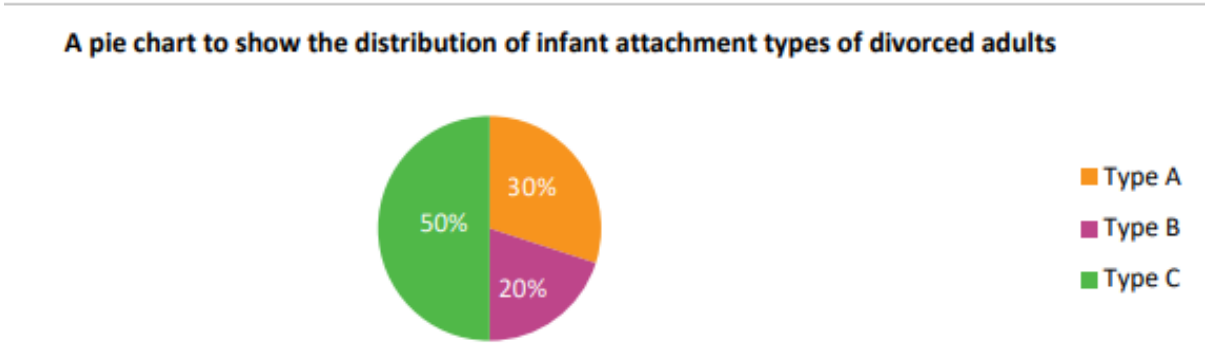
o) $\frac{2}{5}$

Convert to a fraction:

p) 67%

Sample Question

Look at the pie chart below What fraction of divorced adults had a type B attachment?



A. 1/5

B. 3/10

C. 2/5

D. 1/2

5) Ratios

Simplify

a) 5 : 10

b) 15 : 5

c) 5 : 50

d) 52 : 56

e) 52 : 12

f) 52 : 56

g) 18 : 22 : 12

h) 16 : 52 : 48

i) 42 : 15 : 24

Sample question

The findings from the study are presented below:

A table to show the number of participants who perceived the ambiguous image as a monkey or as a teapot from both conditions: image presented with animals and image presented with kitchen items.

	Perceived as a monkey	Perceived as a teapot
Presented with animals	15	10
Presented with kitchen items	5	12

a) Identify and simplify the ratio of the number of participants who perceived a monkey in the first condition and the number who perceived a monkey in the second condition.

b) Identify and simplify the ratio of the number of participants who perceived a teapot in the first condition and the number who perceived a teapot in the second condition.

6) Measures of Central tendency.

a) Find the mean of the data given below.

6 6 1 2 1 8

mean =

b) Find the mean of the given data below, rounding your answer to the nearest whole number.

11 12 28 17 21 24 27

mean =

c) Find the mean of the given data below, rounding your answer to 1 decimal place

11.9 4.8 16.4 18.2 12.3 3.6 2.8 25.6 10.8 0.6

mean =

d) Find the median of the data given below.

15 20 10 15 14 23 14

median =

e) Find the median of the data given below.

20 13 10 20

median =

f) Find the median of the data given below.

23.1 11.1 13.1 30.9 13.5 18.1 14.1 0.3

median =

g) Find the median of the data given below

26.3 18.6 8.8 23.2 29.3 20.9 1.5 0.2

median =

h) Find the mode of the data given below.

1 4 6 2 10 11 12 8 10

mode =

i) Find the mode of the data given below.

9 2 4 3 6

mode =

j) Find the mode of the data given below.

8 6 5 3 3 6

mode =

Sample question

A Psychologist investigated whether recall was affected by the way the material was presented. One group was given pictures to recall, the other group were given words.

Number of Pictures Recalled	Number of Words Recalled
7	4
5	6
10	7
8	5
7	6
5	5
7	9
9	3

Calculate the measures of central tendency for the following set of raw data.

Condition 1 (Numbers of pictures recalled)

a) Mode =

b) Median =

c) Mean =

Condition 2 (Number of words recalled)

d) Mode =

e) Median =

f) Mean =

7) Displaying Data

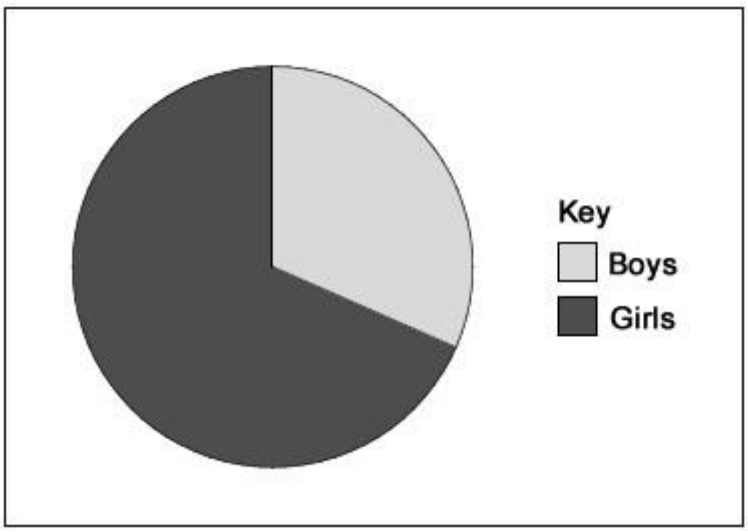
Graphs, charts and tables are all used to describe data and make it easier for the data to be understood.
There are a number of graphs and charts that you need to be able to draw and interpret, they
include:

- Tally chart (frequency table)
- Line graph
- Pie chart
- Bar chart
- Histogram
- Scatter diagram

Sample questions

A researcher is investigating gender differences in classification of attachment. They conduct a study using Ainsworth's 'Strange Situation'. The results are shown in the figure below.

The proportions of boys and girls who are classified as securely attached



(a) Using the information in the figure, estimate the percentage of **boys** and **girls** that are securely attached.

Boys =

Girls =

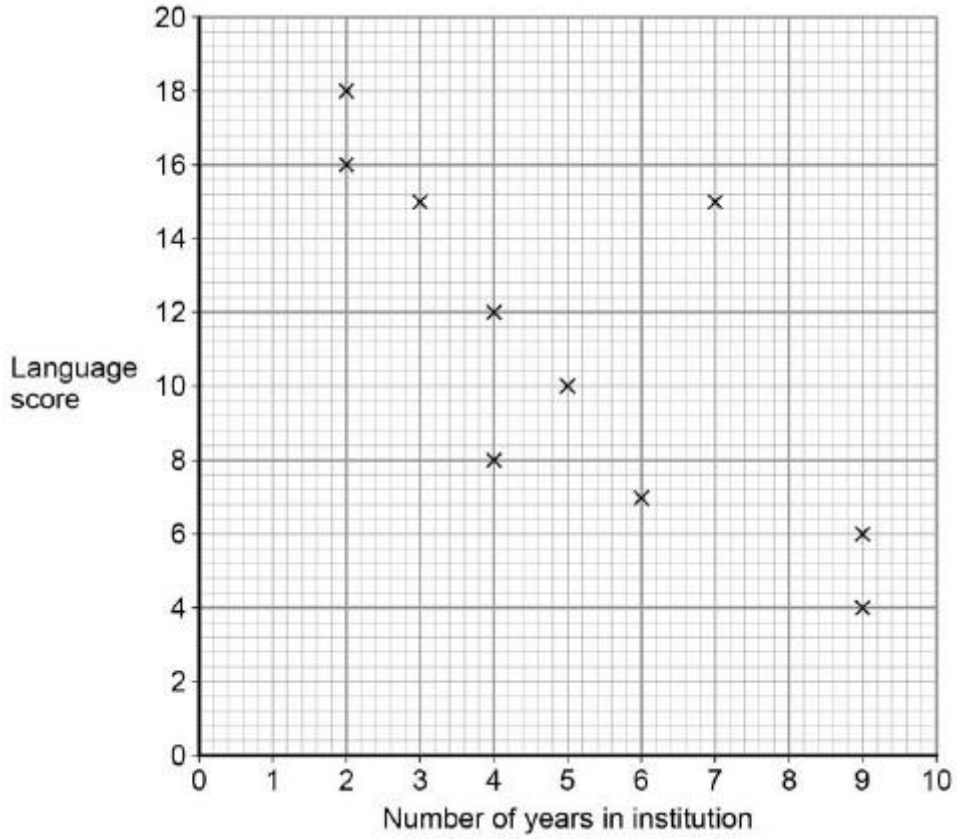
(2)

(b) In a different study, 150 children were classified as securely attached. Of these, 40% were boys. How many of the 150 children were girls? Show your workings.

(2)

A psychologist thinks that there may be a link between language ability and institutionalisation. She tests the language skills of 8-year-old institutionalised children. A high score on the test indicates good language ability and a low score on the test indicates poor language ability. She also records the number of years that each child has been institutionalised. The findings are shown in the figure below.

The relationship between time spent in institution and language score



(c) Identify the type of graphical display in the figure.

A Histogram

B Bar graph

C Line graph

D Scattergram

(1)

(d) How many children took part in the study?

(1)

(e) What does the pattern of data in the figure suggest about language ability and institutionalisation?

(2)

(f) Calculate the range for the language scores. Show your workings.

(2)

Maths in Psychology – answers

1) Using standard form

a) 7×10^6

b) 4×10^6

c) 8×10^5

d) 4×10^7

e) 3×10^7

f) 7×10^5

g) 1.5×10^6

h) 4.8×10^4

i) 4.4×10^3

j) 7.3×10^5

2 Rounding – decimal places

a) 0.4

b) 0.8

c) 0.4

d) 0.6

e) 0.14

f) 0.14

g) 0.46

h) 29.976

i) 46.232

j) 79.092

k) 0.18

l) 8.9

m) 8.93

n) 0.5

o) 0.49

p) 45.7

q) 45.71

3) Rounding – significant figures

a) 20
b) 1000
c) 0.01
d) 2
e) 0.13
f) 0.040
g) 90000
h) 0.640
i) 161
j) 4.9
k) 4.92
l) 5000
m) 5300
n) 5250
o) 200
p) 200
q) 197
r) 0.4
s) 0.41
t) 0.406

4 Using percentages, fractions and decimals

a) 0.5
b) 0.075
c) 0.65
d) 1.53
e) 0.516
f) 0.41
g) 1/5
h) 31/50
i) 9/10
j) 87%
k) 211%
l) 1.7%
m) 291%
n) 90%
o) 40%
p) 67/100

Sample Q:

A 1/5

5 Ratios

a) 1 : 2
b) 3 : 1
c) 1 : 10
d) 13 :14
e) 13 : 3
f) 13 : 14
g) 9 : 11 : 6
h) 4 :13 : 12
i) 14 : 5 : 8

Sample Q:

a) 3 : 1 (simplified from 15 : 5)

b) 5 : 6 (simplified from 10 :12)

6 Measures of central tendency

a) 4
b) 20
c) 10.7
d) 15
e) 16.5
f) 13.8
g) 19.75
h) 10
i) None
j) 6 , 3

Sample Q:

Condition 1

a) 7
b) 7
c) 7.25

Condition 2:

a) 5 , 6
b) 5.5
c) 5.625

7 Displaying data

a) Boys: between 26% and 37% inclusive
   Girls: between 63% and 74%
   Two figures must add up to 100%

b) 90

c) Scattergram

d) 10 children
e) Negative correlation
   The more years spent in an institution the lower their language ability or opposite argument.