1 Read the item and then answer the questions that follow.

Participants in an experiment were shown a film of a robbery. The participants were then divided into two groups. One group was interviewed using a standard interview technique and the other group was interviewed using the cognitive interview technique. All participants were then given an 'accuracy score' (out of 20) based on how closely their recall matched the events in the film (20 = completely accurate, 0 = not at all accurate).

The results of the experiment are shown in the table below.

The median accuracy score for the standard interview and the cognitive interview

	Standard interview	Cognitive interview
Median	10	15

(a) Sketch an appropriate graphical display to show the median accuracy scores in the table above.

(6)

(b)　The experiment used an independent groups design.

Explain how this study could have been modified by using a matched pairs design.

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(4)
(Total 10 marks)

2　Read the text below and then answer the questions that follow.

Two researchers obtained a sample of ten people whose ages ranged from 20-years-old to 60-years-old.

Each participant was asked to take part in a discussion of social care issues. This included discussion about who should pay for social care for elderly people and how to deal with people struggling with mental health problems. A confederate of the researchers was given a script to follow in which a series of discussion points was written for the confederate to introduce.

Each participant then came into a room individually and the discussion with the confederate took place. The maximum time allowed for a discussion was 30 minutes.

The researchers observed the discussions between the confederate and participants and rated the active engagement of the participants in the discussion. The ratings were between 1, (not at all interested) and 20, (extremely interested.) The researchers believed that the rating provided a measurement of the participants' attitudes towards social care issues.

The following data were obtained in the study:

The relationship between age and attitude to social care.

Age of participant	Attitude to social care issues rating
21	5
23	3
34	8
36	12
40	10
47	13
52	17
53	15
58	18
60	20

(a)   Use the graph paper below to sketch a display of the data given in the table above. You do
        not need to give your display a title.
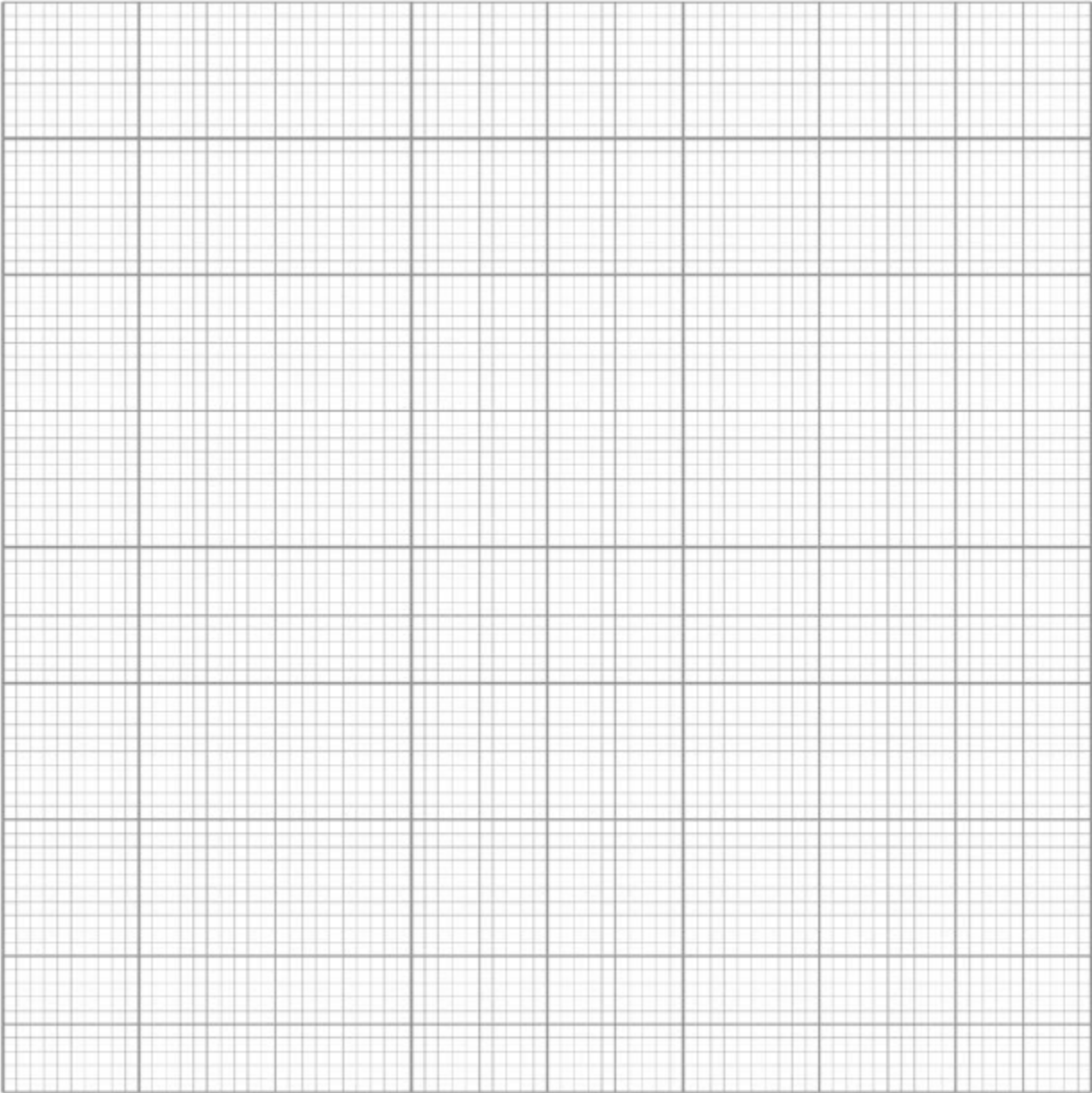
(3)

(b)   What does the display you have drawn in your answer in part (a) suggest about the
        relationship between age and attitude to social care issues? Explain your answer.

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(2)

(c)   The researchers rated the active engagement of the participants in the discussion on social care. They used this rating as a measure of each participant's attitude to social care issues.

Briefly explain how investigator effects might have occurred in this study.

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(2)

(d)   Outline how the researchers could have avoided investigator effects having an impact on the study.

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(2)

The researchers thought it might be interesting to investigate further the attitudes of the participants in the study. They decided to interview each participant. The researchers devised a questionnaire in order to collect the data they required. The questionnaire included both open and closed questions.

(e)   Briefly discuss the benefits for the researchers of using **both** closed **and** open questions on their questionnaire about attitudes to social care.

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(4)

(f)   Write **one** question that you think the researchers might have put on their questionnaire. Explain which type of question you have written and why you think this would be a suitable question for this study.

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(3)

The researchers have obtained both qualitative and quantitative data in the observations and interviews they have conducted.

(g)   Identify the qualitative and quantitative data collected in this study. Explain your answer.

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(4)

(h)　Explain how the researchers should have addressed **two** ethical issues in the investigation.

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(4)
(Total 24 marks)

3　Read the item and then answer the questions that follow.

> A psychologist investigating the investment model of relationships, devised a self-report Investment Scale for use with a group of 100 female participants. The scale gave an investment score for each participant on a scale of 0–20, with 0 representing no investment in relationships and 20 representing extreme investment in relationships.
>
> The psychologist calculated measures of central tendency for the investment scores. He found that the mean investment score was 8.6, the median investment score was 9.5 and the mode investment score was 13.

(a)　Sketch a graph to show the most likely distribution curve for the investment scores in this study. Label the axes of your graph and mark on it the positions of the mean, median and mode

(3)

(b)　What sort of distribution does your graph show?

(1)
(Total 4 marks)

4 Read the item and then answer the questions that follow.

> In a study of androgyny, a group of 100 18-year-old students completed a self-report sex-role inventory. The inventory gave two sets of scores: a femininity score and a masculinity score. Each set of scores was on a scale of 0–20, with 0 representing no masculinity or no femininity and 20 representing extreme masculinity or extreme femininity.
>
> The researchers calculated measures of central tendency for the masculinity scores. They found that the mean masculinity score was 10.3, the median masculinity score was 9.5 and the mode masculinity score was 7.

(a) Sketch a graph to show the most likely distribution curve for the masculinity scores in this study. Label the axes of your graph and mark on it the positions of the mean, median and mode.

(3)

(b) What sort of distribution does your graph show?

(1)
(Total 4 marks)

5 Read the item and then answer the questions that follow.

> A psychologist investigating egocentrism interviewed 100 parents, each of whom had a four-year-old child. She asked each parent to rate his or her child's egocentrism on a scale of 0–10, with 0 representing no egocentrism and 10 representing extreme egocentrism.
>
> The psychologist calculated measures of central tendency for the egocentrism scores. They found that the mean egocentrism score was 4.8, the median egocentrism score was 5 and the mode egocentrism score was 6.

(a) Sketch a graph to show the most likely distribution curves for the egocentrism scores in this study. Label the axes of your graph and mark on it the positions of the mean, median and mode.

(3)

(b) What sort of distribution does your graph show?

(1)
(Total 4 marks)

6 Briefly outline **one** method for reducing addiction **and** explain **one** limitation of this method.

(Total 4 marks)

7   Two groups of patients took part in a trial to compare the effectiveness of two different drug therapies. One of the groups was given **Drug A** and the other group was given **Drug B**. All patients completed a rating scale at the start of a ten-week course of treatment and again at the end of the course. This scale measured the severity of symptoms.

The **Drug A** group had an average score of 9 before the therapy and an average score of 4 at the end of the course.

The **Drug B** group had an average score of 7 before the therapy and an average score of 5 at the end of the course.

Sketch and label a bar chart to illustrate the data.
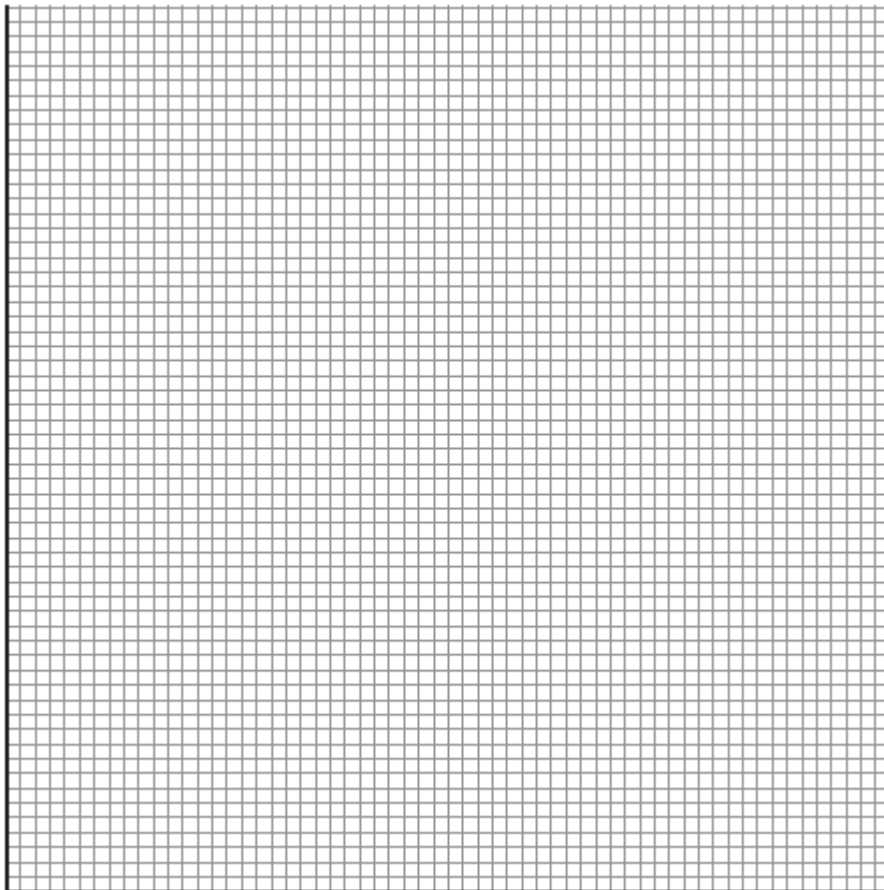
(Total 4 marks)

8   A student teacher was interested in the relationship between empathy (consideration and feelings for others) and the time spent reading fiction. She decided to investigate whether or not such a relationship was present in children.

The student teacher designed her own questionnaire to measure empathy in 8-year-old children. The higher the score achieved, the greater the empathy. Twenty children, all from one school, took part. Each child completed the questionnaire individually.

The student teacher designed another questionnaire to measure 'time spent reading fiction'. Each child was given this questionnaire to take home and complete with his or her parents over a four-week period. 'Time spent reading fiction' included the time spent by parents reading to the child as well as the time the child spent reading independently. Using the responses to this questionnaire, the student teacher calculated how much time per week, on average, each child spent reading fiction.

The data obtained are shown in the graph below.

Scattergram of children's scores on a test of empathy and the average number of hours spent reading fiction per week.

(a)   Outline the relationship between empathy and the average number of hours spent reading fiction per week shown in the graph above.

(1)

(b)   Name an appropriate test to determine whether or not there is a significant relationship between the two variables in the graph above. Justify your answer with reference to levels of measurement.

(2)

The student teacher decided to use a two-tailed test.

(c)   Outline **one** way in which the student teacher could have assessed the validity of the empathy questionnaire.

(2)

(d)   Apart from the issue of validity, identify and briefly explain **one** methodological limitation of the study.

(2)

(e)   Explain why it was appropriate for the student teacher to use a correlation study rather than an experiment.

(3)

(f)   The student teacher noticed that some students on her course commented that they were better able to recall information if they could read the information rather than listen to it in lectures.

Design an experiment to test the following hypothesis:

'People who are given written information will recall more than people who hear information in spoken form.'

In your answer, you should refer to the following and justify your design decisions:

*   the variables to be considered

*   the experimental design to be used

*   the sample

*   relevant materials

*   an outline of the proposed procedurr.

(8)
(Total 18 marks)

9

A group of researchers conducted a survey about helping behaviour. They asked an opportunity sample of 200 university students to complete a questionnaire. The questionnaire contained open and closed questions. The following are examples of questions used in the questionnaire:

A   Do you think that you are generally a helpful person?   Yes   No

B   What do you think most people would do if they were driving in the rain and saw a woman standing alone next to her broken-down car?

C   How would you react if someone walking in front of you slipped and fell over?

(a)   Identify an open question from **A**, **B** or **C** above. Give **one** advantage of using open questions.

Example of open question (write **A**, **B** or **C**) ....

(1)

Advantage ....

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(1)

The researchers then categorised the responses given to question **C** above.
The results are shown in **Table 1**.

Table 1: The number of participants who gave the following responses to question C

Help the person	Ignore the person	Laugh at the person	Other reactions
137	23	31	9

(b)   What conclusion might the researchers draw from the responses given in **Table 1** above?
Justify your answer.

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(2)

On the basis of the responses to question **C**, the researchers decided to conduct a further
investigation. The aim was to see whether an individual's helping behaviour might be
affected by the presence of other people.

The participants were an opportunity sample of 40 first-year students. The students were
told that they would be interviewed about university life. Each student was met by an
interviewer and asked to wait. The interviewer then went into the next room. After two
minutes there was a loud noise and a cry of pain from the next room.

Twenty participants took part in **Condition 1** and the other 20 participants took part in
Condition 2.

Condition 1 Each participant waited alone.

Condition 2 Each participant waited with another person who had previously been told by
the researchers not to react to the sounds from the next room.

The researchers counted the number of participants in each condition who went to help the
interviewer in the next room.

(c)   Write a suitable experimental hypothesis for the further investigation.

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(2)

(d)   Suggest **one** extraneous variable that might be present in the further investigation.
        Explain why this variable should be controlled and how it could be controlled.

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(3)

(e)   Identify the experimental design used in the further investigation. Explain why this is a
        suitable experimental design for this study.

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(3)

(f)   Explain how random sampling might have been used to select the participants in the further investigation.

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(2)

The results of the further investigation are given below.

Table 2: Number of participants who went to help the interviewer in Condition 1 and Condition 2

Condition 1 (Participant waiting alone)	Condition 2 (Participant waiting with another person)
20	9

(g)   Suggest a suitable graphical display that could be used to represent the data in **Table 2**. Justify your choice.

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(2)

(h) After the further investigation, the researchers debriefed the participants. Discuss **two** points that the researchers should have included when they debriefed the participants.

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(4)
(Total 20 marks)

10

A maths teacher wondered whether there was a relationship between mathematical ability and musical ability. She decided to test this out on the GCSE students in the school. From 210 students, she randomly selected 10 and gave each of them two tests. She used part of a GCSE exam paper to test their mathematical ability. The higher the mark, the better the mathematical ability. She could not find a musical ability test so she devised her own. She asked each student to sing a song of their choice. She then rated their performance on a scale of 1–10, where 1 is completely tuneless and 10 is in perfect tune.

(a) Suggest a suitable non-directional hypothesis for this study.

(3)

(b) Why might the measure of musical ability used by the teacher lack validity?

(3)

(c) Explain how the teacher could have checked the reliability of the mathematical ability test.

(3)

(d)   Explain why the teacher chose to use a random sample in this study.

The results of the study are given in the table below.

Mathematical ability test scores and musical ability ratings for 10 students

Student	Mathematical ability test score	Musical ability rating
1	10	10
2	2	9
3	9	3
4	6	6
5	3	9
6	10	2
7	2	1
8	1	8
9	8	4
10	4	7

(2)

(e)   In your answer book, sketch a graph to show the data in the table above.
Give the graph an appropriate title and label the axes.

(3)

(f)   Discuss what the data in the table above and the graph that you have
sketched seem to show about the relationship between mathematical ability
and musical ability.

(3)

(g) The teacher noticed that most of the students who were rated highly on musical ability were left-handed. The teacher is aware that her previous definition of musical ability lacked validity.

Design a study to test whether there is a difference in the musical ability of left-handed students and right-handed students. You have access to a sixth form of 200 students.

You should:

- identify the design that you would use

- explain an appropriate sampling method and justify your choice

- describe the procedure that you would use, including details of how you would assess musical ability

- write a suitable debrief for these participants.

(10)

(h) In your answer book, draw a table to show how you would record your results. Identify an appropriate statistical test to analyse the data that you would collect. Justify your choice.

(3)
(Total 30 marks)

11 A researcher investigated the effect of age of starting day care on levels of aggression. Four-year-old children attending a day nursery were used. Each child was assessed by the researcher and given an aggression score. A high score indicated a high level of aggression. A low score indicated a low level of aggression. The maximum score was 50.

Mean aggression scores for four-year-old children who had started day care before the age of two or after the age of two

	Started day care before the age of two	**Started day care after the age of two**
Mean score	25	23

(a) Identify the operationalised independent variable **and** the operationalised dependent variable in this study.

Operationalised independent variable ....

....

Operationalised dependent variable ....

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(4)

(b) What do the mean scores in the table above suggest about the effect of age at which children started day care on children's aggression?

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(2)

(c) Name **one** measure of dispersion that the researcher could have used to describe the data.

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(1)

(d)   Draw an appropriate bar chart to display the data presented in the table above.
        Correctly label your bar chart.
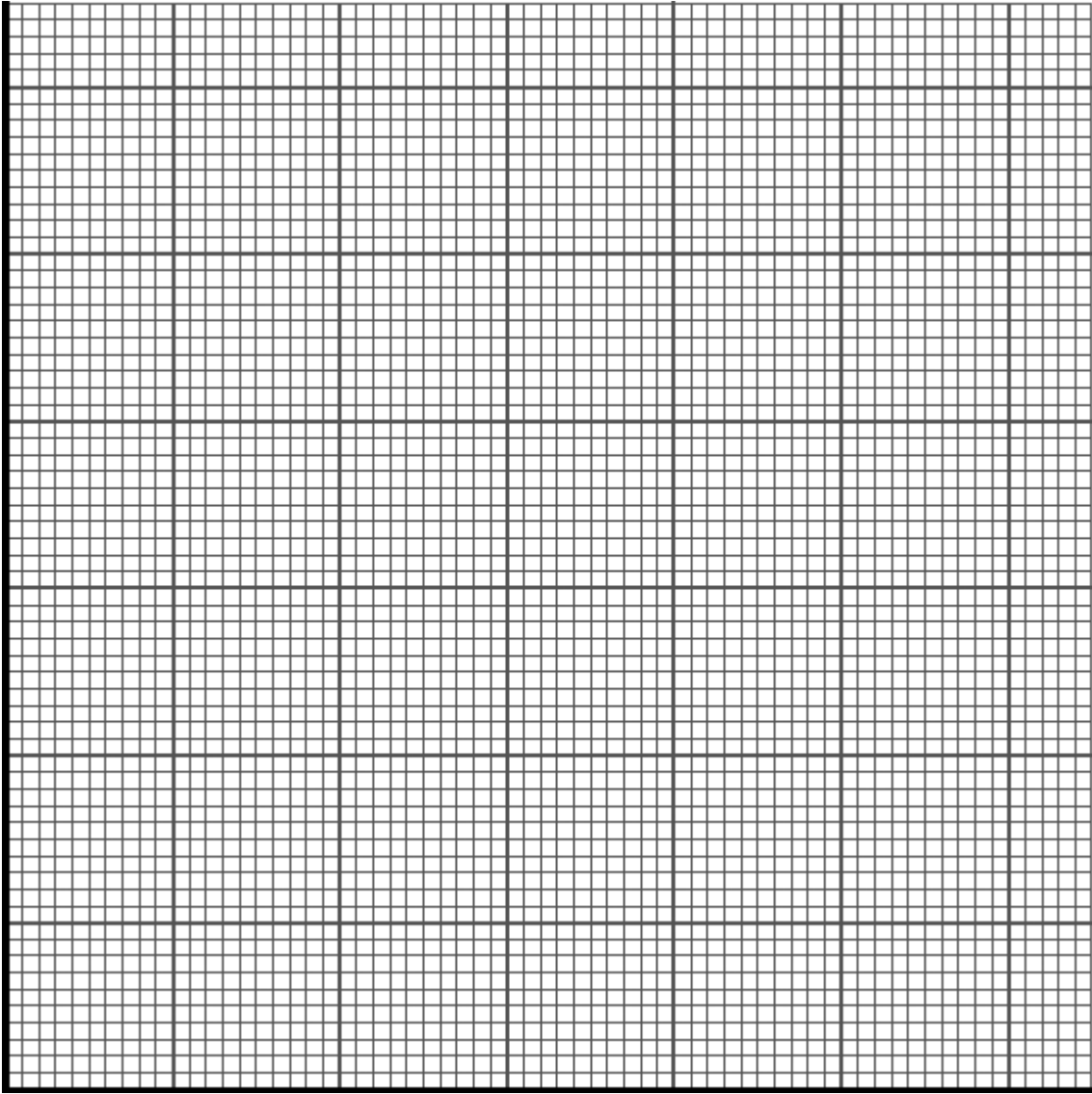
                                                                                                    (3)

(e)   State an appropriate directional hypothesis for this study.

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                                                                                                    (2)
                                                                                    (Total 12 marks)

12

The following scattergram shows the relationship between the number of weeks of treatment with ECT and the score on the Self-Rating Depression Scale (on this scale, a high score indicates depression).

Relationship between weeks of treatment and scores on depression scale
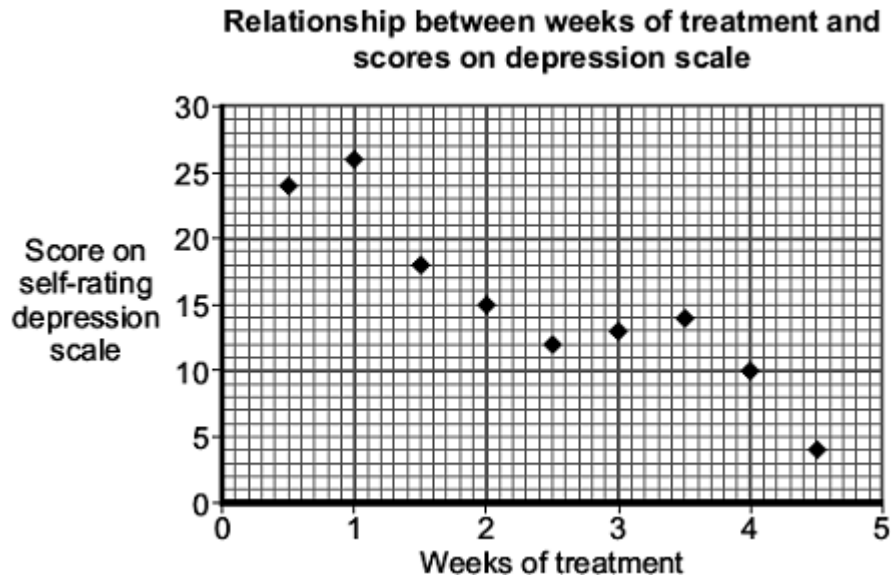
Outline what the scattergram seems to show.

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(Total 4 marks)

13

A psychologist wanted to investigate whether or not the presence of an audience had an effect on the performance of a task.

The task was to shoot netballs through a hoop. Each participant took 20 shots.

The experiment took place in a school sports hall.

The psychologist obtained the sample of participants from a local secondary school for girls. She drew the names of 40 participants at random from a list of girls who all played netball regularly. The first 20 participants drawn took part in the experimental condition and the next 20 participants took part in the control condition.

In the experimental condition, each participant took 20 shots. In this condition, 50 pupils from the school acted as an audience watching the performance.

In the control condition, the other 20 participants performed the same task, but this time without the audience watching.

The psychologist observed each girl's performance and recorded the number of netballs successfully shot through the hoop.

(a)   State an appropriate hypothesis for this study.

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(2)

The results of the study are shown in the table below.

The mean number of netballs successfully shot through the hoop in the presence and absence of an audience.

	Mean number of netballs successfully shot through the hoop
Presence of an audience	15
Absence of an audience	9

(b)   What might the psychologist conclude from the data in the table above? Justify your
       answer.

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                                                                                                          (2)

(c)   Sketch an appropriate graphical display of the data shown in **Table**.

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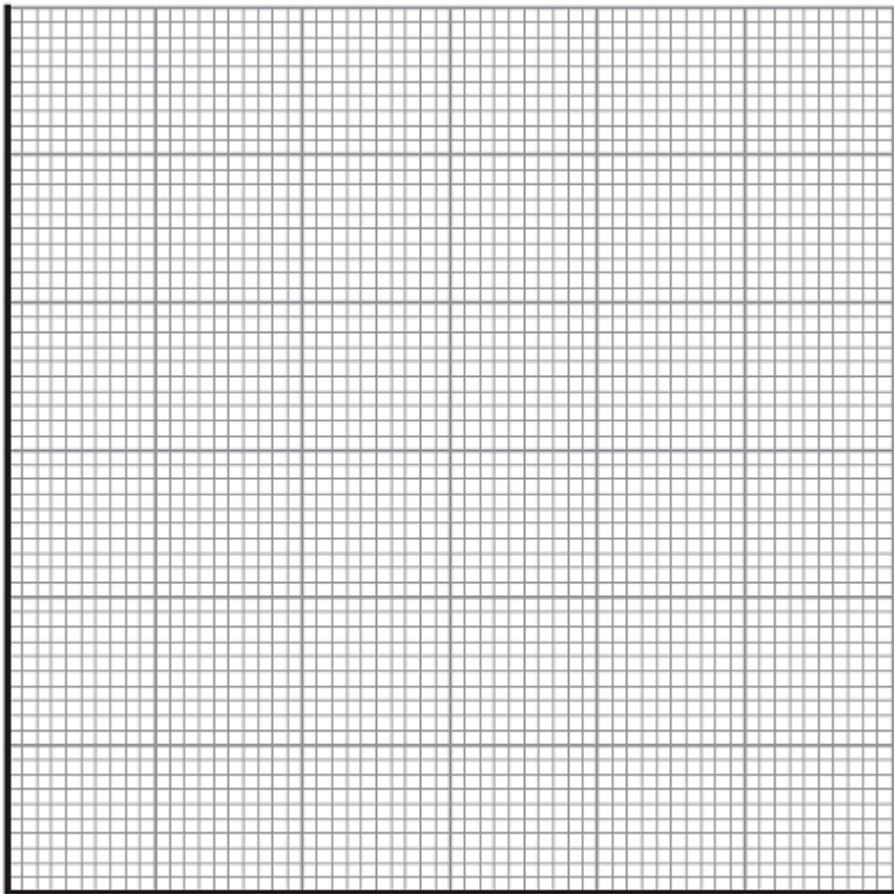
                                                                                                          (3)

(d) The psychologist used random sampling to select the participants in this study.

Explain **one** strength of using a random sample.

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(2)

(e) (i) The psychologist used an independent groups design in this study.

Briefly explain **one** limitation of using an independent groups design in this study.

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(2)

(ii) Explain how the limitation that you have identified in your answer to **(e) (i)** might have been overcome.

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(2)

(f) (i) What is meant by an *extraneous variable*?

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(1)

(ii) Explain why it is important to control extraneous variables in experimental research.

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(2)

(g)   Write a short set of instructions that the psychologist could have read to the participants in the experimental condition.

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Extra space ....

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(4)
(Total 20 marks)

14

Read the text below and answer the questions that follow.

A psychologist is using the observational method to look at verbal aggression in a group of children with behavioural difficulties. Pairs of observers watch a single child in the class for a period of one hour and note the number of verbally aggressive acts within ten-minute time intervals. After seeing the first set of ratings, the psychologist becomes concerned about the quality of inter-rater reliability. The tally chart for the two observers is shown in the table below.

Table: Observation of one child – number of verbally aggressive acts in ten-minute time intervals

Time slots	0–10	11–20	21–30	31–40	41–50	51–60
Observer A	2	5	0	6	4	3
Observer B	4	3	2	1	6	5

(a)   Use the data in the Table above to sketch a scattergram. Label the axes and
        give the scattergram a title.

(4)

(b)   Using the data in the Table above, explain why the psychologist is concerned
        about inter-rater reliability.

(4)

(c)   Identify an appropriate statistical test to check the inter-rater reliability of these
        two observers. Explain why this is an appropriate test.

(3)

(d)   If the psychologist does find low reliability, what could she do to improve
        inter-rater reliability before proceeding with the observational research?

(4)
(Total 15 marks)

Mark schemes

1 (a) **[AO2 = 6]**

1 mark for each of the following:

- display as a bar chart
- both axes labelled correctly
- an informative title with reference to the IV and DV
- y axis has appropriate scaling
- bars are separate
- bars are plotted reasonably correctly.

The median accuracy score for the standard interview and the cognitive interview

Standard interview: 10
Cognitive interview: 15
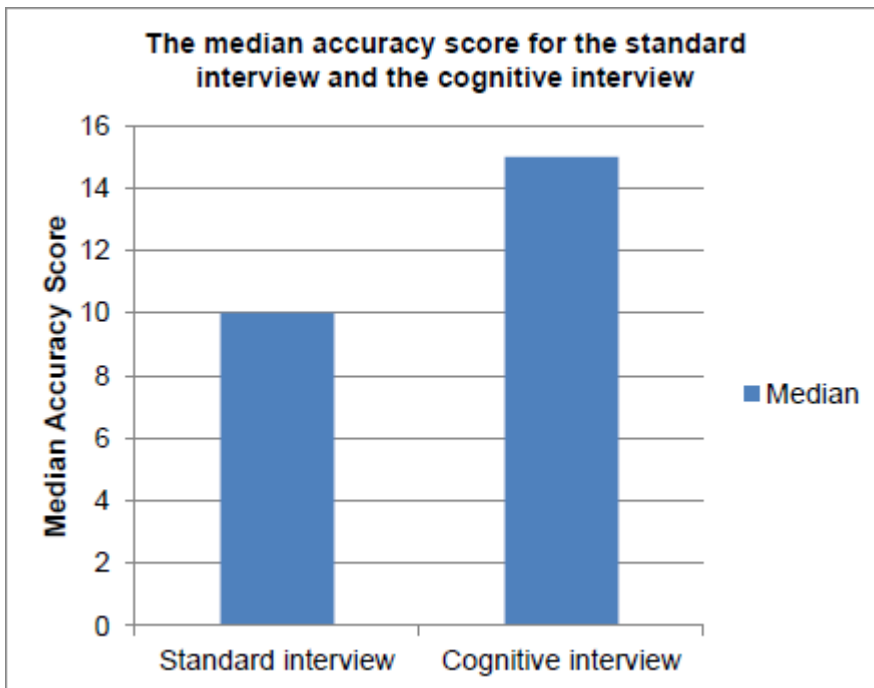
(b) **[AO3 = 4]**

Award **one mark** for each of the following points:

- the researcher needs to ensure that the two groups are matched for key variables
- example of at least one key variable – any that might reasonably be expected to affect memory in this situation, eg eyesight, age, intelligence
- all participants should be pre-tested / assessed for the key variable / variables
- for each person in one condition, the researcher should assign a 'matched' person in the other condition.

Credit other relevant points or this information embedded in the example.

2 (a) **Marks for this question: AO2 = 3**

Scatter graph with y-axis labelled "Attitude of social care rating" (0 to 25) and x-axis labelled "Age of particpant" (0 to 70).

Scatter graph with y-axis labelled "Age of participant" (0 to 70) and x-axis labelled "Attitude of social care rating" (0 to 25).
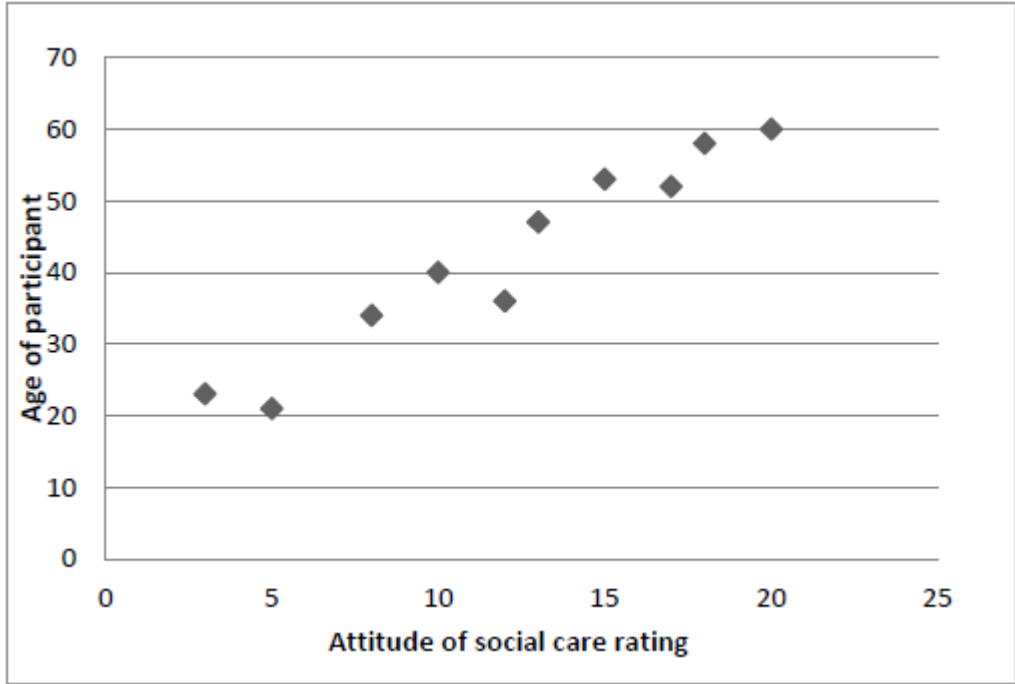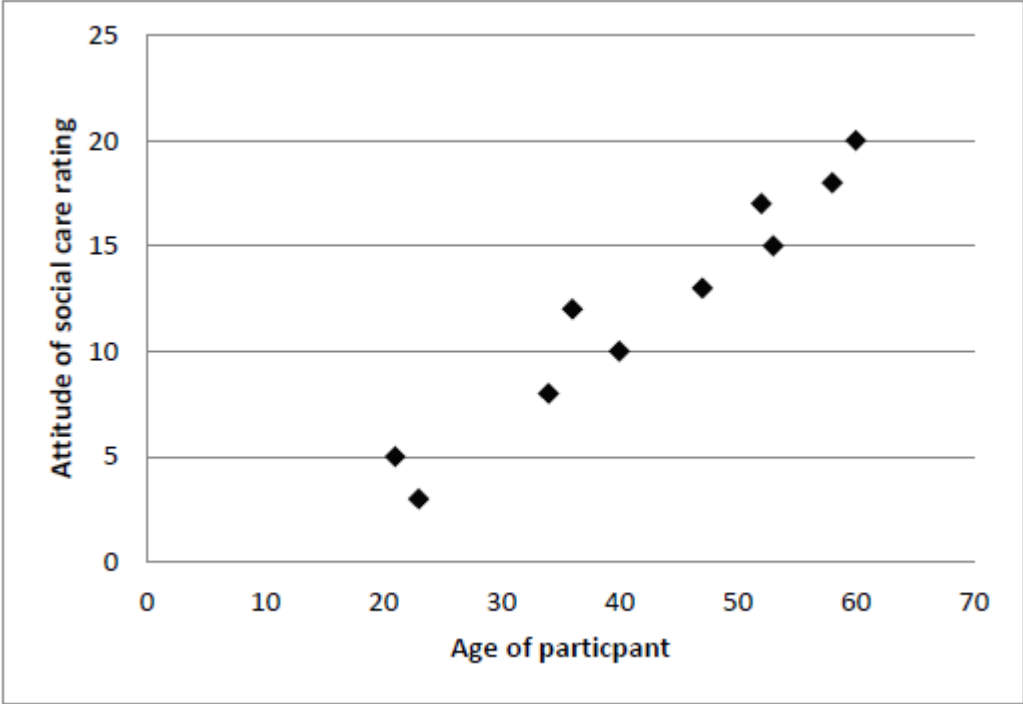
3 marks for the following points:

- Axes correctly labelled as Age of participant and Attitude to social care rating.
- Scales are suitable.
- Points plotted accurately.

(b)   **Marks for this question: AO2 = 2**

2 marks for: there is a **positive relationship** between age and interest in social care issues / as people get older their interest in social care increases (1) this is because as the values on one co-variable increase, so do the values on the other co-variable (1) OR as age increases so does attitude to social care **rating / score**.

(c)   **Marks for this question: AO2 = 2**

1 mark for knowledge of an investigator effect – this is when the person collecting the data has knowledge of what the research aim is / traits and that knowledge / those traits affect the data obtained.

1 mark for a brief explanation of how investigator effects might have occurred in this study.

If the researchers believed that older people would be more interested in social care they could have just given scores based on the age of the person.

(d)   **Marks for this question: AO3 = 2**

2 marks for explaining how investigator effects could have been avoided in the study. The answer needs to explain what could be done and how that would decrease / eliminate the effect.

Possible content:
•   Discussion of separate observation by the two researchers and comparison – inter-rater reliability.
•   Having 'blind' rating of the discussion by someone who is unaware of the aim or research hypothesis.
•   Filming the discussions so there is a permanent record that can be checked by peer review of the data to confirm the scores / ratings.

Credit other relevant procedures.

(e)   **Marks for this question: AO2 = 4**

Level	Marks	Description
2	3 – 4	Explanation of how closed and open questions are beneficial is clear. The answer is generally coherent with effective use of terminology.
1	1 – 2	There is limited / partial reference to the benefit(s) of closed and open questions. The answer lacks accuracy and detail. Use of terminology is either absent or inappropriate. **OR** answer only refers to either closed or open questions at Level 2.
	0	No relevant content.

Possible content:

- Closed questions would present participants with options for their response so the researchers would be able to collate and display the information collected easily.
- Closed questions make it easy to compare specific response to questions the researchers wanted answered – they can be sure there will be certain information because they have restricted the options to include that information.
- Open questions allow respondents to interpret the question as they wish to and develop their response with detail or depth – so there is lots of information received.
- Open questions allow the researchers to pursue a line of enquiry that they may not have predicted but which comes to light because of a response by an interviewee.

Credit other relevant procedures.

(f) **Marks for this question: AO2 = 3**

- **1 mark** for an appropriate open or closed question – requiring information about a social care issue.
- **1 mark** for correct identification of this as an open or closed type of question.
- **1 mark** for a suitable explanation for why the choice was appropriate – this could relate to producing a type of data (closed – ease of analysis, open – lots of detail or depth to response / allows respondent to elaborate her / his reasoning for the response given) or it could focus on an issue of social care introduced by the candidate and not in the stem.

(g) **Marks for this question: AO1 = 2 AO2 = 2**

AO2
1 mark: the responses to the open questions in the interview constitute qualitative data.
Plus
1 mark: the attitudes ratings **AND / OR** the collated responses to the closed questions in the interview constitute quantitative data.

AO1
1 mark for an explanation of how the responses to the open questions is qualitative data ie is non-numeric / descriptive / retains detail of actions / thoughts / feelings.
Plus
1 mark for an explanation of how the ratings / collated responses to closed questions is quantitative data ie numerical such as a score / behaviour is represented in the form of a score on a scale.

(h)   **Marks for this question: AO3 = 4**

2 marks for each explanation of how the chosen ethical issue could be dealt with.

1 mark for a brief muddled explanation.
2 marks for a clear explanation.

Consent – to be part of what is in essence two studies. Participants should be forewarned – a briefing.

Protection from harm – at the end of participation all will have to be fully aware that they were rated for their social care interest and a low score might indicate they are 'uncaring'. They may wish to withdraw their data.

Right to withdraw – being made aware that they can at any time stop participating and at the end of their participation they can withdraw detail of their behaviour in the research.

The explanation must demonstrate an appreciation that people should be dealt with, with respect and competence.

Credit other relevant ethical issues.

3   (a)   **[AO2 = 3]**
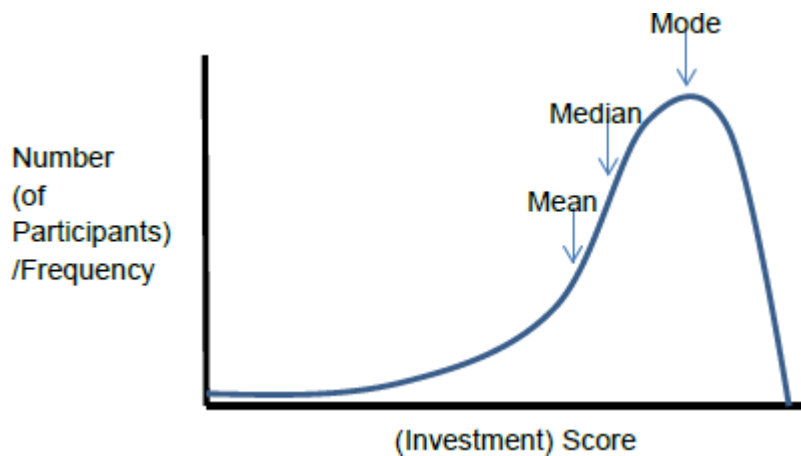
Credit a rough sketch of a negatively skewed distribution as follows:

1 mark for shape of curve with tail to the left.

1 mark for axis labels – '(Investment) Score' on horizontal axis, 'Number (of Participants)' / 'Frequency' on vertical axis.

1 mark for positioning the mean, median and mode appropriately in relation to one another.

(b)   **[AO2 = 1]**

1 mark for stating negative skew.

If graph sketched in (a) does not show a negative skew, credit answers that match the sketch given.

4   (a)   **[AO2 = 3]**
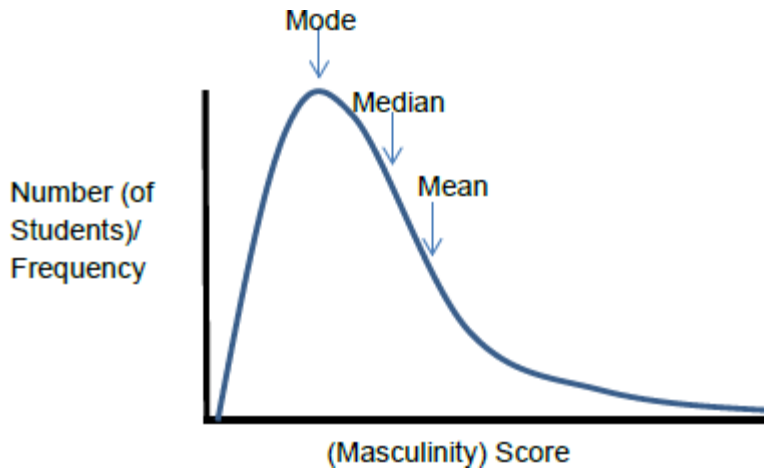
Credit a rough sketch of a positively skewed distribution as follows:

1 mark for shape of curve with tail to the right.

1 mark for axis labels – '(Masculinity) Score' on horizontal axis, 'Number (of Students)' / 'Frequency' on vertical axis.

1 mark for positioning the mean, median and mode appropriately in relation to one another.

(b)   **[AO2 = 1]**

1 mark for stating a positive skew.

If the graph sketched in (a) does not show a positive skew, credit answers that match the sketch given.

5 (a) **[AO2 = 3]**
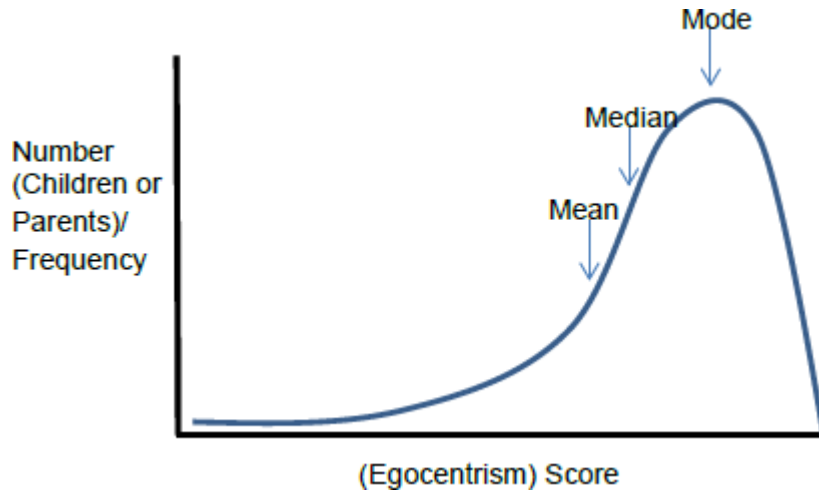
Credit a rough sketch of a negatively skewed distribution as follows:

1 mark for shape of curve with tail to the left.

1 mark for axis labels – '(Egocentrism) Score' on horizontal axis, 'Number (Children or Parents)' / 'Frequency' on vertical axis.

1 mark for positioning the mean, median and mode appropriately in relation to one another.

(b) **[AO2 = 1]**

1 mark for stating a negative skew.

If the graph sketched in part (a) does not show a negative skew, credit answers that match the sketch given.

6 **[AO1 = 2 and AO3 = 2]**

Level	Marks	Description
2	3 – 4	Outline of one method for reducing addiction is clear and has some detail. A limitation is clearly explained. The answer is generally coherent with effective use of terminology.
1	1 – 2	Outline of one method for reducing addiction lacks clarity. The limitation is generic / stated rather than explained. The answer as a whole is not clearly expressed. Terminology is either absent or inappropriately used. **Either** outline **or** limitation is done well.
	0	No relevant content.

Possible methods:

- drug therapy, eg outline of named drug and mode of action
- behavioural interventions, eg outline of specific procedures and related mechanisms involved in aversion therapy or covert sensitisation
- cognitive behaviour therapy, eg outline of stage by stage process
- theory of planned behaviour and / or Prochaska's model as used to illustrate a method.

Credit other relevant methods.

Possible limitations:

will depend on the method outlined but likely responses include:

- drug therapy – side effects and dependency issues with drugs such as methadone
- aversion therapy – ethical issues
- CBT – issues of commitment and motivation
- theory of planned behaviour and Prochaska's model are more descriptive and lack empirical support for effectiveness.

Credit other relevant limitations.

7

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- AO1 knowledge and understanding
- AO2 application (of psychological knowledge)
- AO3 evaluation, analysis, interpretation.

AO3 = 4

Average rating scores for effectiveness of two different drug therapies before and after treatment

Average rating scores for effectiveness of two different drug therapies before and after treatment
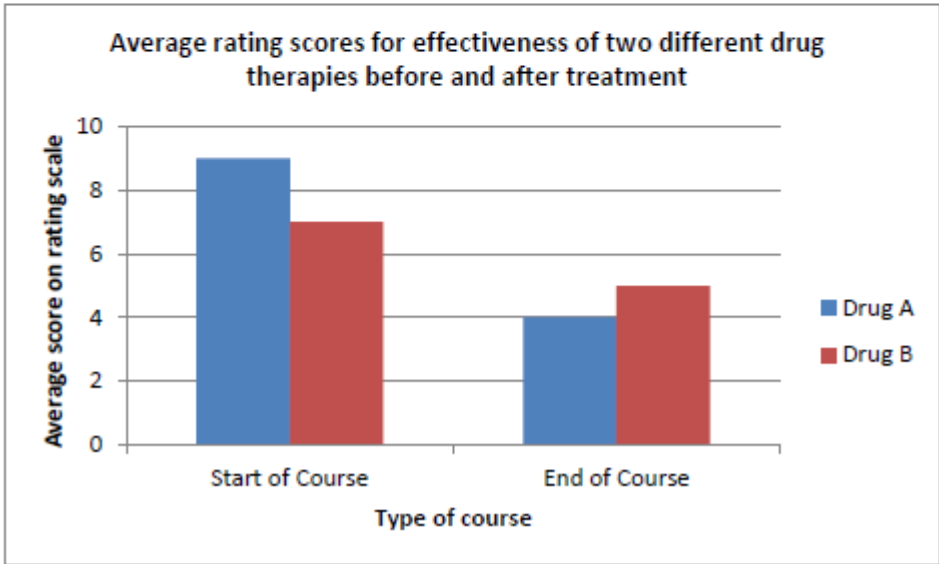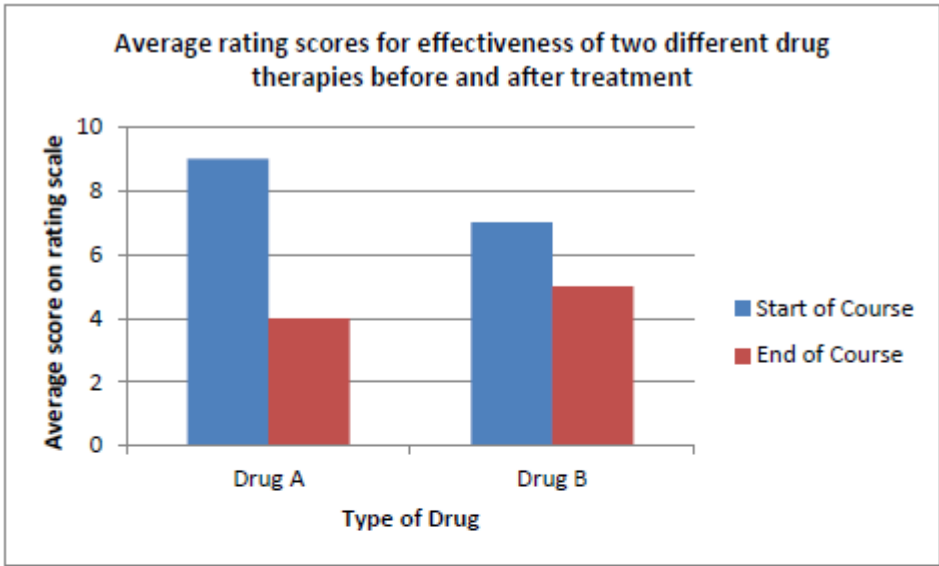
1 mark for correctly labelled x-axis: either with over-arching label, e.g. Type of Drug, or by clearly labelling the 2 conditions e.g. Start and End of course.

1 mark for correctly labelled y-axis: average score on (rating) scale.

Up to 2 marks for clearly sketching a bar chart. For full marks, there needs to be an appropriate use of graph paper and bars labelled correctly.

8   Please note that the AOs for the new AQA Specification (Sept 2015 onwards) have changed. Under the new Specification the following system of AOs applies:

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- AO3 evaluation, analysis, interpretation.

(a)   **[AO3 = 1]**

One mark for answers either:

•   referring to the strength and the direction of the relationship – a positive correlation between the number of hours spent reading fiction and the empathy test score.
      or:
•   describing the relationship – the more hours spent reading fiction, the greater the empathy test score.

No credit for just stating type of correlation eg strong positive.

(b)   **[AO3 = 2]**

One mark for naming a test: Spearman's rank order correlation / rho or Pearson's product moment correlation.
One mark for justification. For Spearman's rank order correlation accept: not all data is interval – data collected for empathy test score most likely treated at ordinal level of measurement due to self-report.
For Pearson accept: Pearson's product moment correlation is a robust test, even if not all data can be treated as truly interval.

Just stating ordinal / interval no credit. Accept ordinal or interval providing this is justified with reference to at least one variable.

Unlikely but allow for an informed argument made for treating both sets of data at interval level.

(c)   **[AO3 = 2]**

1 mark for a knowledge of a way (not just naming a type of validity) and 2nd mark for explaining how this would be implemented in this case. Most likely answers will address face validity or concurrent validity, but accept any other way such as construct validity, content validity, criterion validity and predictive validity.

For full marks, the answer must refer to either the empathy questionnaire or empathy test items. The 'way' need not be named or defined.

(d)   **[AO3 = 2]**

One mark for the identifying a methodological limitation of the study.
Likely answers: size / composition of sample / one school only; for test of empathy –
no evidence of testing reliability; parental involvement in 'time spent reading
questionnaire'; self-report measures; correlation study.
One mark for a brief explanation.
Suggested explanations might cover: limits to generalisation; confidence in a test and
its findings rests on it being deemed reliable; social desirability of parental responses
and consequent bias; honesty of reporting / memory recall; cause and effect issues in
correlation studies.
Accept any other plausible answers.

(e)   **[AO3=3]**

Up to three marks for a discussion of reasons for correlation studies rather than
experiments when investigating behaviour.
Likely answers: unethical / impossible to manipulate these variables (reading and
empathy in children) to investigate cause and effect; impractical to sometimes do an
experiment; may discover a link between two existing variables which might suggest
future research ideas; interested in relationships **rather than** a causal explanation.
Accept comparison with the experimental approach.
For full marks, the answer must be coherent and applied to this study.
Maximum of two marks for general answers not applied to this study.

(f)   **[AO3 = 8]**

Up to 8 marks for answers demonstrating an ability to design an experiment
effectively. Answers should refer to:

•   clearly identified independent and dependent variables and at least one
        extraneous variable identified and control suggested;
•   the experimental design – independent groups, repeated measures or matched
        pairs;
•   detail of sample;
•   materials required for carrying out the research, eg task for assessing levels of
        recall, timing device if needed;
•   sufficient procedural details to carry out a replication (might include standard
        instructions, ethics, etc.)

Note: standardised instructions and ethical issues are not required for full marks.

Mark bands

8 – 7 marks	**Very good answers** All 5 points well addressed and some sound justification. Answer shows sound knowledge and understanding and an ability to design an appropriate experiment. The proposal is coherent and feasible, and includes details of all the essential elements of the chosen design. Information allows for clear understanding of the proposed design. There may be some minor omission(s) at the bottom of the band.
6 – 5 marks	**Good answers** 3 or 4 points well addressed and some justification. The design shows knowledge and understanding and some ability to design an appropriate experiment. The proposal is feasible but may lack the clarity and coherence of the top band. There may be some inaccuracies and omissions.
4 – 3 marks	**Average to weak answers** At least 3 points are addressed and attempt at justification. The answer shows some knowledge and understanding but detail of the proposal may lack clarity. There are inaccuracies and omissions.
2 – 1 marks	**Poor answers** 1-2 points are addressed. There must be some relevant material. The experimental method may not be obvious. There may be substantial confusion, inaccuracy and / or irrelevance.
0 marks	**No relevant content**

9

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• AO1 knowledge and understanding
• AO2 application (of psychological knowledge)
• AO3 evaluation, analysis, interpretation.

(a) **[AO3 = 2]**

One mark for either B or C.

One mark for an appropriate advantage of using open questions.
Likely points: open questions provide depth / detail / greater diversity of responses / more meaningful information in the response; they avoid participant frustration associated with fixed choice responses.

(b)   **[AO3 = 2]**

One mark for an appropriate conclusion that might be drawn, eg: the majority of people **regard themselves** as kind and helpful people.(Accept alternatives such as 'see themselves, believe or think they are / say they would')

One mark for justification of the answer with reference to the data given, eg: the number of people who reported they would help the person is much higher than any other response given (about 75% said they would help the person).

Accept other valid conclusions with an appropriate matching justification.

(c)   **[AO3 = 2]**

Up to 2 marks for an appropriate experimental hypothesis. For full credit the hypothesis must be a testable statement and contain both the IV and DV.

Possible answers for 2 marks:
Non-directional: There is a difference in the number of participants who go to help / help someone when the participant waits alone and when the participant waits with another person.

Directional: More participants who wait alone go to help / help someone than participants who wait with another person. (Accept 'Fewer'.)

Accept null version of the hypothesis.

Possible answers for 1 mark:

There will be a difference in the number of participants who go to help / help in Condition 1 and Condition 2

People who wait alone are more likely to go to help / help than people than people who wait with someone else.

(d)   **[AO3 = 3]**

One mark for identification of a possible extraneous variable.
Likely answers: the behaviour of the interviewer who 'falls'; the behaviour of the confederate in the waiting room. Accept EVs based on participant variables eg gender and appropriate condition variables such as 'noise.'

One mark for explaining why the EV should be controlled.

One mark for explaining how it could be controlled.

Possible answers:
The behaviour of the interviewer who falls must be the same – the same sounds and cries so that each participant has the same incident to react to. This could be controlled by using a taped recording of the falling and crying out.
The behaviour of the confederate must be the same so that each participant has the same environment in the waiting room. This could be controlled by using the same person as a confederate who has a script he / she follows for each participant.

(e)   **[AO3 = 3]**

One mark for identification of the experimental design as independent groups / measures.

Up to 2 marks for explanation of why this is a suitable design for this study.
Likely points: the participants can only be exposed to the person 'falling' once (1) as they will then have some understanding of what the study is trying to find out and their behaviour will be affected by this knowledge (lack of naivety) (1).

Maximum of 1 mark for generic explanations not linked explicitly to the study

(f)   **[AO3 = 2]**

Up to 2 marks for an outline of the procedure of random sampling:

Possible answer:
Put the name of every first year student at the university into a hat (number every first year student)(1).
Draw out 40 names or numbers for the sample (use a random number table / computer program to generate a set of 40 numbers – this represents the sample) (1).

(g)   **[AO3 = 2]**

One mark for an appropriate suggestion.
Likely answer: Bar chart / bar graph, frequency graph. Accept pie chart.

One mark for justification of the suggestion.
Likely point: the display clearly demonstrates the numerical difference between the two conditions. Credit discrete data / categorical data.

If more than one graphical display is listed – mark the first answer.

(h)   **[AO3 = 4]**

For each of the TWO points, allow one mark for identification of the point and one further mark for discussion of why that point should be raised when the participants are debriefed. Max 2 marks for each point.

For full marks at least one of these points must focus on imparting the aim / purpose of the study or detail of the two conditions.

One further mark for discussion of the chosen point.

Maximum 2 marks if only ethical issue(s) discussed. These 2 marks can only be given for **one** ethical issue (1) that is appropriately discussed (1).

Likely points: explanation of the aim of the study; explanation of the use of independent groups; ethical issues, (these include deception, protection from harm / treating participants with respect; right to withdraw data from the study.)

Verbatim answers are likely to be credited with a maximum of two marks as there would be no discussion / explanation.

10   (a)   **AO2 / AO3 = 3**

A suitable non-directional hypothesis would be 'There is a correlation (relationship) between pupils' scores on a test of mathematical ability and pupils' scores on a test of musical ability'.

3 marks for a fully operationalised non-directional hypothesis.
2 marks for non-directional hypothesis that identifies both variables but does not operationalise them.
1 mark for non-directional hypothesis where the variables are not identified.
No marks for a null or directional hypothesis or one referring to association or difference.

(b) **AO2 / AO3 = 3**

The main issue is that the teacher has made up her own test:

- This involved subjective judgement on the part of the teacher who rates the students' musical ability. Her judgement may not reflect real differences in musical ability and is likely to differ from other people's judgement and / or any absolute criteria for tunefulness.

- Lack of reliability in rating musical ability would compromise the validity of the measure.

- As the students can choose the song they will sing, the rating of ability could reflect the teacher liking / dislike of the song rather than the student's ability.

- The rating may be invalid as the students selected songs which varied in difficulty so the tunefulness reflected the difficulty of the song not the students' ability.

- Operationalising musical ability as tuneful singing is a very narrow measure. Someone can have musical ability such as playing an instrument which would not be reflected by this measure.

1 mark for identifying an appropriate reason.
2 further marks for elaboration, explanation of why it is a problem, how it might affect the result or for further reason(s).
Note that 3 marks can be awarded for one reason elaborated or more than one reason in less detail.

(c) **AO2 / AO3 = 3**

In the case of the maths test candidates could refer to split half or test retest as methods of checking reliability. They could also refer to checking the reliability of scoring by using two separate markers for the test and comparing the scores. Credit any other appropriate suggestion.

1 mark for identifying an appropriate method or a brief explanation eg 'repeat the maths test'.
2 further marks for appropriate elaboration.

(d) **AO2 / AO3 = 2**

The teacher chose to use a random sample because it would probably be more representative of the whole GCSE group than if she had used an opportunity or volunteer sample. Candidates could also say that she had ready access to her target population making it convenient for her to select a random sample.

No credit for definition of a random sample.
1 mark for a brief or muddled reason (it is not biased).
2 marks for a reason that clearly points to an advantage of random sampling. This could be achieved through a comparison with another method (it is less likely to be biased than a volunteer sample).

(e)   **AO2 / AO3 = 3**

Credit should only be awarded for scattergraphs. Other graphs gain 0 marks.

1 mark for appropriately plotted scores.
1 mark for an appropriate title.
1 mark for correctly labelled axes.

Relationship between scores on a mathematics test and scores on a test of musical ability

(Scattergraph: x-axis "Mathematical ability test score" (0–12), y-axis "Musical ability test score" (0–12). Plotted points approximately: (1,8), (2,9), (3,9), (2,1), (4,7), (6,6), (8,4), (9,3), (10,2), (10,10).)

Relationship between scores on a mathematics test and scores on a test of musical ability

(Scattergraph: x-axis "Musical ability test score" (0–12), y-axis "Mathematical ability test score" (0–12). Plotted points approximately: (1,2), (2,10), (3,9), (4,8), (6,6), (7,4), (8,1), (9,3), (9,2), (10,10).)

(f)   **AO2 / AO3 = 3**

Up to 3 marks for a discussion of the relationship between mathematical and musical ability. Likely points include:

- The graph seems to show a negative correlation between mathematical and musical ability.

- This means that high scorers in mathematical ability tend to achieve low scores on musical ability and vice versa.

- The presence of two strong outliers, means that the actual correlation is very weak and closer to zero.

- Comment on the small sample size which limits the conclusions that could be drawn.

- Credit can be achieved for plausible interpretations of the strength of the correlation which are justified (ie looks moderate to strong or the outliers make it weak in practice) or those based on rough calculations (around -0.2).

1 mark for a very brief answer eg negative correlation or zero correlation.
2 further marks for elaboration/discussion this could be focused on one point in detail or several points in less detail.

(g)   **AO2 / AO3 = 10**

In this question, candidates are asked to design a study to test if there is a difference between left-handed and right-handed students in musical ability.

Design – 1 mark

- Award 1 mark for identification of an appropriate design (independent measures or matched pairs).

Sampling – 2 marks

- Award 1 mark for explaining an appropriate sampling method and 1 further mark for justifying why this method would be appropriate. As left-handed people are less common in the population than right-handed people this needs to be addressed in the sampling method.

Procedure and assessment of musical ability – 4 marks

Award 1 mark for procedure, 1 mark for assessing musical ability and two further marks for elaboration of either or both of these.

- Description of the procedure eg each participant will be given a standardised musical ability test, participants should be tested within a controlled environment, with minimal noise or distraction.

- Students are required to suggest a plausible alternative method of assessing musical ability to the one in the stem (eg singing a short, novel phrase played on the piano). Further credit could be given for stating that the test should be identical for all students or for explaining how it will be assessed.

Debrief – 3 marks

- Award up to 3 marks for writing a debrief. This could include the aim of the study, thanking participants for taking part, asking if they have any questions, relevant ethical considerations.

- If this is not suitable to be read out to participants, maximum 1 mark.

(h)   **AO2 / AO3 = 3**

Award 1 mark for a clear table appropriate for the study described in (h).

Musical ability scores:

Participant number	Left handed	Right handed
1		
2		
3		

Award 1 mark for the identification of an appropriate statistical test for the proposed design.
Award 1 mark for one correct justification eg a test of difference, at least ordinal level data.

11

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(a)   **AO3 = 4**

The independent variable is age at which the children started day care, or whether the children started day care before or after age 2.
1 mark for age.
2 marks where the IV is operationalised as above.
The dependent variable is aggression score as assessed by the researcher.
1 mark for aggression.
2 marks for aggression score, measure of aggression, level of aggression.

If either IV or DV is identified but not entirely clear – 1 mark.

(b)   **AO3 = 2**

1 mark for pointing out the difference is small or the age of starting day care didn't make much difference to mean aggression score.
1 mark for stating the children who started day care before age 2 had a higher mean score than those who started after the age of 2.
1 mark for saying both groups mean score was approximately half the maximum.
Maximum 2 marks.
Eg "The mean aggression score was slightly higher for children who started day care before the age of 2." 2 marks
Candidates can gain 2 marks by two brief points or one point elaborated.

(c)   **AO3 = 1**

1 mark for: range
                semi-interquartile range
                interquartile range
                standard deviation or
                variance.

Do not credit: deviation or interquartile.

(d)   **AO3 = 3**

0 marks if the candidate has not drawn a bar chart.
1 mark if the candidate has drawn a bar chart but the scale is clearly inappropriate and not correctly labelled.
2 marks if the candidate has drawn a correctly labelled bar chart but the scale is clearly inappropriate; or the candidate has drawn an appropriate bar chart but the labelling is incomplete eg vertical axis refers to mean score or aggression score rather than mean aggression score.
For full marks the bar chart should indicate a small difference. Both bars and the vertical axis should be correctly labelled.

(e)   **AO3 = 2**

0 marks for a non-directional hypothesis or a correlational hypothesis.
1 mark if either variable is not operationalised eg day care makes children more aggressive or the answer is slightly muddled.
2 marks for eg Children who start day care before age 2 have higher aggression scores than those who start day care after age 2, or Children who start day care at a younger age will be assessed as more aggressive than children who start day care at an older age.
Credit a directional hypothesis in the opposite direction.

12 **AO3 = 4**

The graph shows a strong negative correlation between score on depression scale and weeks of treatment. The more treatments the lower the depression. However, there also seems to be a plateau, where between 2-3.5 weeks there is very little change in depression.

1 mark for each of the following:

•   Strength (it is a moderately strong / strong correlation)

•   Direction (negative)

•   Description of the relationship (the longer the treatment the lower the depression score)

•   Indication of plateau / change in direction.

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- AO2 application (of psychological knowledge)
- AO3 evaluation, analysis, interpretation.

Although the essential content for this mark scheme remains the same, mark schemes for the new AQA Specification (Sept 2015 onwards) take a different format as follows:

- A single set of numbered levels (formerly bands) to cover all skills
- Content appears as a bulleted list
- No IDA expectation in A Level essays, however, credit for references to issues, debates and approaches where relevant.

(a)   **[AO3 = 2]**

For two marks, a clear, testable statement containing both conditions of the IV and an operationalised DV.

For one mark, a statement containing both conditions of the IV and a DV.

No marks for expressions of aim, questions, correlational hypotheses or statements without two conditions.

Possible answers:

Directional: Participants will successfully shoot more netballs through the hoop in the presence of an audience than in the absence of an audience.

Note: Also accept a directional hypothesis opposite to the above.

Non-directional: There will be a difference in the number of netballs successfully shot through the hoop for participants who perform in the presence of an audience and participants who perform in the absence of an audience.

Credit null hypothesis.

(b)   **[AO3 = 2]**

One mark for an appropriate conclusion eg the presence of an audience has a positive effect on the performance of the task (or similar response) (AO3, 1).

One mark for the justification of the response eg the mean number of netballs successfully shot through the hoop is higher when there is an audience than when there is no audience (or similar response) (AO3, 1).

(c)   **[AO3 = 3]**
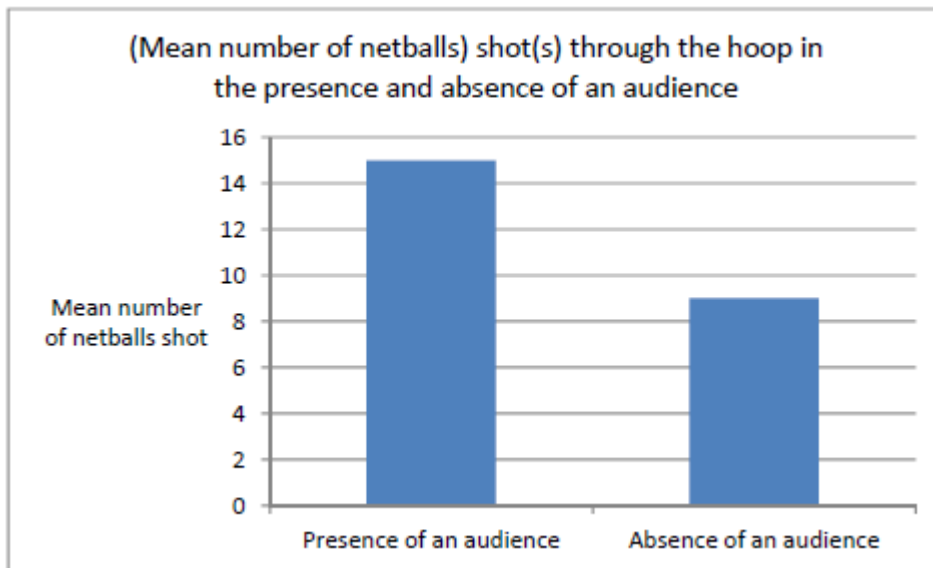
To gain the maximum three marks, candidates must provide the following:

•   An appropriate title for the graphical display
•   Appropriate axes and labelled eg presence / absence of an audience
•   Plotting of data using a sensible scale / no penalty for joined bars.

Line graphs can be credited for title and axes only.

(d)   **[AO3 = 2]**

One mark for a relevant strength.
One mark for how / why it is a strength.

Likely strengths: more likely to be representative of the target population; able to generalise to the target population; to exclude researcher bias etc.

(e)   (i)   **[AO3 = 2]**

One mark for a relevant limitation of an independent groups design.
One mark for how / why in relation to this study eg individual differences in ability / height etc.

(ii)   **[AO3 = 2]**

Up to two marks for an appropriate explanation of how the problem may have been overcome.

Possible answer: Using a repeated measures design (1) plus explanation of how this could be done or why this would improve the study.

Credit answers that refer to matched pairs / need for random allocation.

Can credit (ii) in respect of incorrect answer to (i).

(f) (i) **[AO3 = 1]**

One mark for correct knowledge of the term.

Possible answer: A variable other than the independent variable or an additional / or another variable that might have an effect on the dependent variable, only accept the word 'results' for DV (1).

(ii) **[AO3 = 2]**

One mark for stating that if EVs are not controlled for, then the results may be confounded (1) the researcher does not know what is causing the effect (1) or other suitable expansion eg effect on reliability or validity.

Do not accept - results will not be accurate.

Credit answers that refer to the study by way of illustration.

(g) **[AO3 = 4]**

Instruction must be written verbatim for more than 1 mark.

Essential points - reference to presence of audience
                       - reference to shooting (hoops) throwing (hoops)

Optional   - where to stand
                       - ethics
                       - introduction of self

4 marks	Both essential and at least one optional point addressed clearly such that completion of the task in the experimental condition would be easily possible. Information should be clear, relevant, sensible and logically structured. Must be verbatim.
3 marks	Both essential points are addressed such that completion of the task in the experimental condition would be relatively easy. There may be deficiencies in clarity, some irrelevance, illogical sequencing or inappropriate content. Must be verbatim.
2 marks	Any two points are addressed. There may be omissions / irrelevancies / muddle such that completion of the task would be very difficult. Must be verbatim.
1 marks	There must be at least one relevant point (optional or essential). Information may be unclear / inappropriate / irrelevant / muddled such that completion of the task would be very difficult.
0 marks	No relevant information. Completion of the task would not be possible.

NB 2 - 4 marks = Verbatim Instructions

14

(a) **AO2 / 3 = 4**

For any credit, candidates must sketch a scattergram.
For full marks, candidates should provide an appropriate title for the scattergram, label each of the axes appropriately and plot the data accurately on the scattergram.

Each of the examples below is a full mark answer because:

- it is clearly a sketch of a scattergram

- the data are appropriately plotted

- the labels of the axes and the title taken together show full understanding of the nature of the data.

(b) **AO2 / 3 = 4**

For full marks, candidates should give a reasonably detailed explanation eg she is concerned because the observers should both recognise the same types of verbal behaviour as aggressive and you would expect their tallies to be very similar. In this case, the observers disagree in every 10-minute time interval even though they are both watching the same child and should be using the same criteria. In some time slots, there is a really big difference in the number of acts.
This suggests that the observers have interpreted the criteria differently or that, at certain times, one observer was more vigilant then the other (4 marks).

1 mark – 'because the observers do not agree with each other'.
3 further marks for elaboration.
Candidates who simply describe what is meant by inter-rate reliability can gain no marks.

(c) **AO2 / 3 = 3**

1 mark for identifying the appropriate test – Spearman's Rho or Pearson's (with appropriate justification).
2 further marks for explaining why it is appropriate ie the psychologist is testing for a correlation and the data that can be treated as ordinal.
Candidates can gain no marks on this question if their choice of statistical test is inappropriate.

(d)   **AO2 / 3 = 4**

1 mark for a very brief answer eg 'better training for the observers'
3 further marks for elaboration.

There is a breadth / depth trade-off here. Candidates can elaborate on one improvement eg explain how the training might be improved or outline several improvements in less detail eg establish clearer criteria for categorising verbal aggression, filming the child so that the observers can practise the categorisation.