GCSE to A-level progression: Mathematical skills answer booklet

Activity 1: Ratios, fractions and percentages

Question	Answer
1.	B (1:3)
2.	55% (**2 marks**). 22/40 × 100 (**1 mark**). **1 mark** for correct workings but incorrect answer.
3.	45% (**2 marks**). 9/20 = 0.45 × 100 (**1 mark**). **1 mark** for correct workings but incorrect answer.
4.	(i) 80% (ii) 70%
5.	i) Correct answer = B ii) Correct answer = C
6.	**2 marks** for correct answer 55(%). **1 mark** for correct workings only 22/40 = 0.55 x 100.
7.	**2 marks** for correct ratio in simplest form (even in the absence of any workings): 2017 = 1:7 Award **1 mark** overall for correct ratio not presented in simplest form, eg 2017 – 5:35, 25:175, 125:875.

Activity 2: Calculations

Question	Answer
1.	**2 marks** for 250 hours OR for 1000/10 x 2.5 = 250 hours OR for 100 x 2.5 = 250 hours. **1 mark** for correct workings but incorrect answer eg 15000 minutes.

Activity 3: Maths symbols

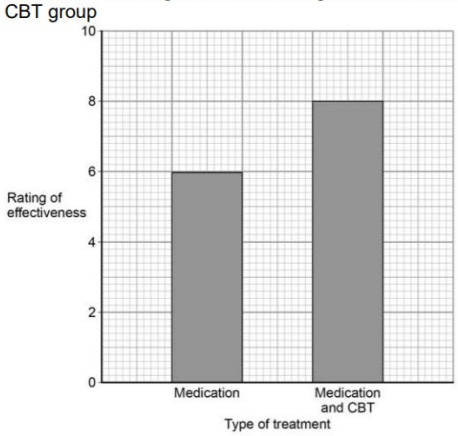
Question	Answer
1.	B (2 students)
2.	**1 mark**: 7 **1 mark:** lower/less than **1 mark:** we are told that all 15 scores are different **1 mark** for any **one** of the following; • this means that, when they are ordered from lowest to highest, the median would be the 8th score/middle/centre score • the above represented pictorially • stating 7 would be below and 7 would be above the middle value of 23 • a valid formula-based answer.

Activity 4: Descriptive statistics

<table>
<tr><th>Question</th><th>Answer</th></tr>
<tr><td>1.</td><td>
<table>
<tr><th>Description</th><th>Term</th></tr>
<tr><td>Calculated by looking at the middle score in a set of data after the data has been put into ascending order</td><td>C</td></tr>
<tr><td>Calculated by finding the most frequently occurring score</td><td>B</td></tr>
<tr><td>Calculated by adding up all of the scores and dividing the total by the number of participants</td><td>A</td></tr>
</table>

1 mark for each correct answer.
</td></tr>
<tr><td>2.</td><td>Median is 11 for Group A (9 + 13/2) and 8.5 for Group B (8 + 9/2)</td></tr>
<tr><td>3.</td><td>8 (2 marks)
5, 6, 7, 8, 8, 8, 9, 9, 10, 10 (1 mark)

Marks for this question: AO2 = 4 Award one mark for each bullet point
• Use of a suitable diagram – ie a bar chart or frequency diagram
• Informative title
• Correct labelling of both axes
• Correct plotting of the results

A bar chart showing the median ratings of effectiveness for a medication group and for a medication and CBT group
 

</td></tr>
<tr><td>4.</td><td>Task A: 2 marks for correct answer 63 (secs).

1 mark for correct workings only 630/10.

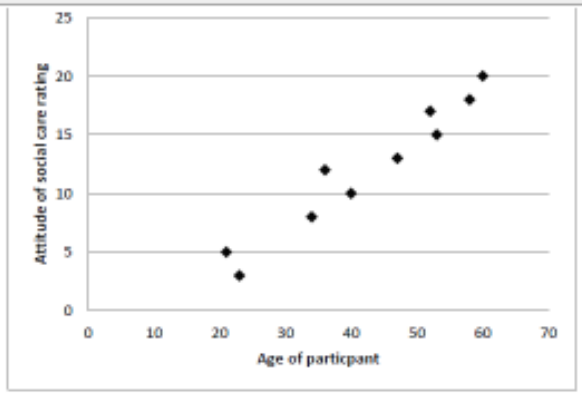
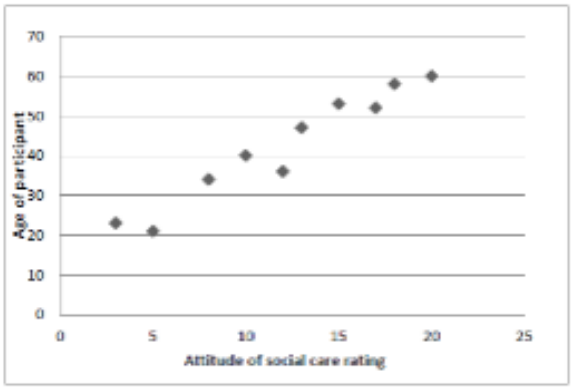
Task B: 2 marks for correct answer 77.4 (secs).

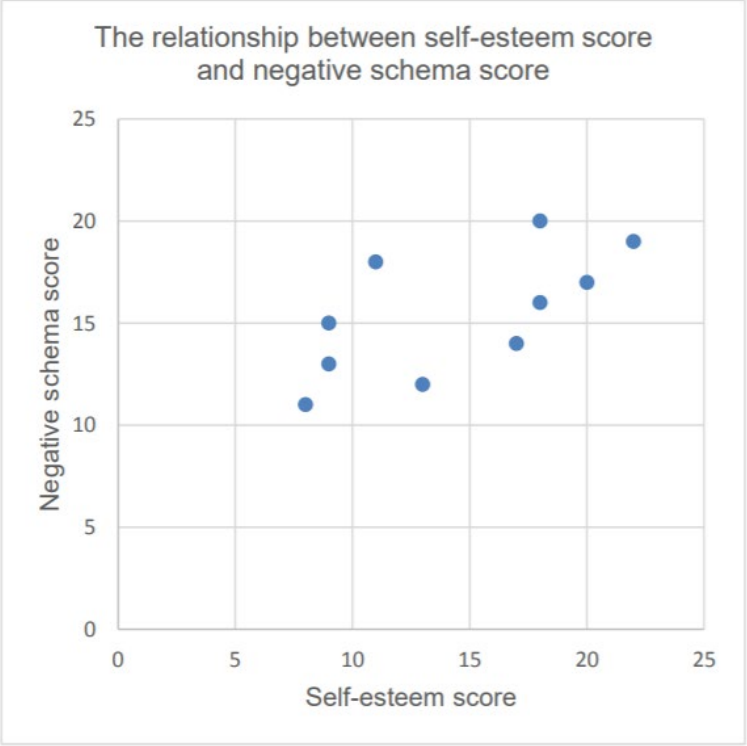
1 mark for correct workings only 774/10.</td></tr>
</table>

Activity 5: Significant figures

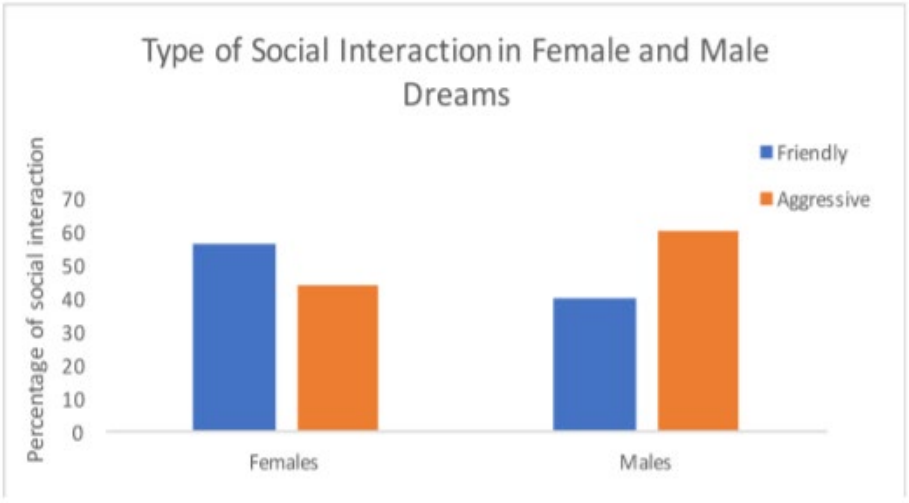
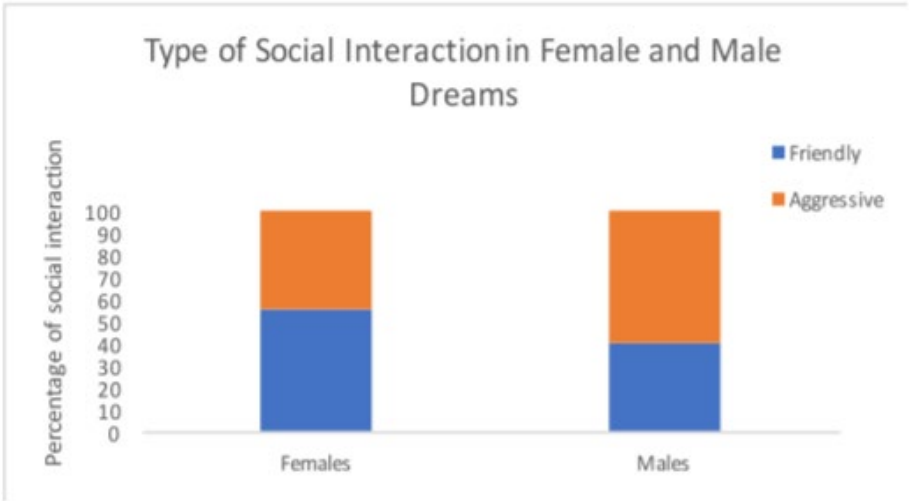
Question	Answer
1.	4.88%
2.	**3 marks** for the correct answer given to two significant figures: 8.4 (even if no correct workings are shown). **2 marks** for correct answer not given to two significant figures, eg 8.35714, 8.3571, 8.357, 8.36 or 8. **1 mark** if incorrect answer is provided but all workings are correct. Correct workings: 9+8+8.5+7+7.5+10.5+8= 58.5 58.5/7 = 8.35714286 Answer = 8.4 hours.
3.	**3 marks** for the correct answer given to two significant figures: 13 (even if no correct workings are shown). **2 marks** for correct calculation not given to two significant figures e.g. 12.7 and no additional attempt at changing 12.7 to another answer. **1 mark** if incorrect answer e.g. 12 is provided but all workings are correct. Correct workings: 13 + 13 + 11 + 8 + 11 + 14 + 11 + 13 + 15 + 18 = 127 127/10 = 12.7 Answer = 13.

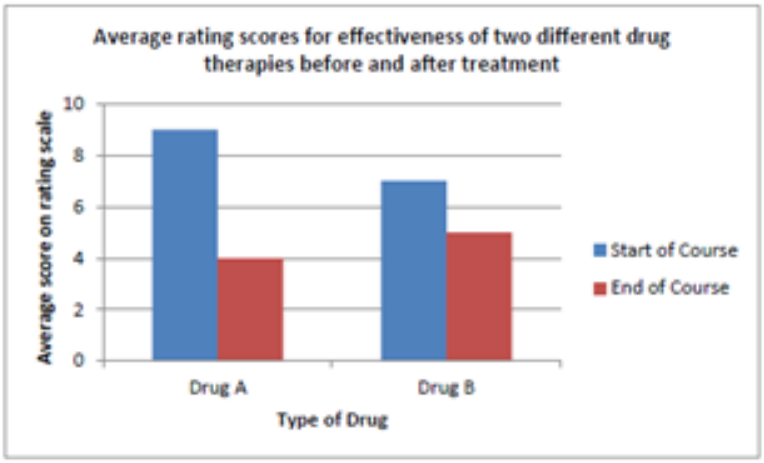
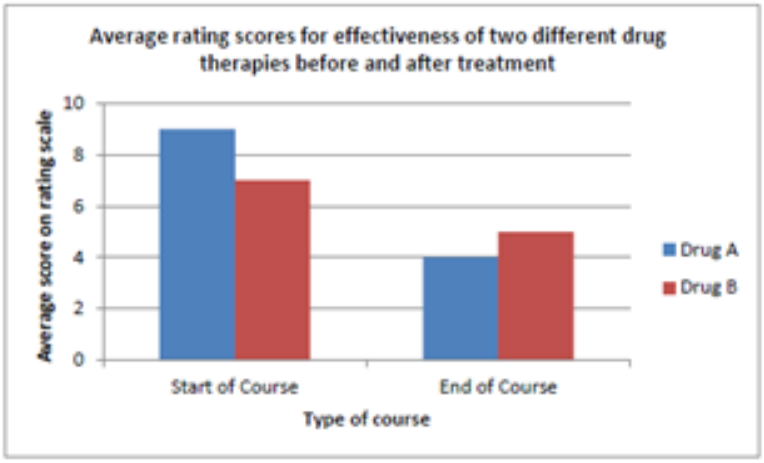
Activity 6: Correlation

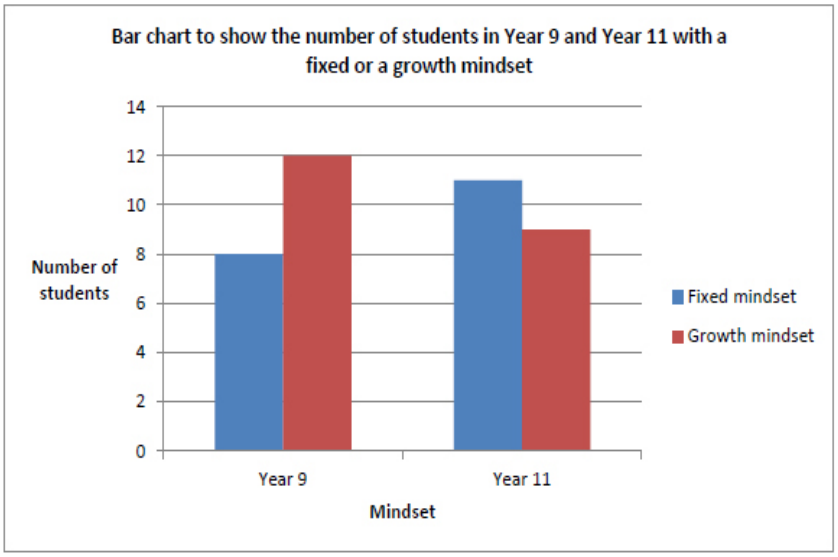
Question	Answer
1.	  **3 marks** for the following points: • Axes correctly labelled as Age of participant and Attitude to social care rating. • Scales are suitable. • Points plotted accurately. (b) **[AO2 = 2]**
2.	A positive correlation.

Question	Answer
3.	**1 mark** for each of the following: • a title that includes both co-variables and reference to correlation/relationship • appropriately labelled X axis • appropriately labelled Y axis • accurately plotted points. 

Activity 7: Construct and interpret tables, diagrams and graphs

Question	Answer
1.	**1 mark** for each of the following: • appropriate title with reference to the IV and the DV • accurately plotted data, bars must not touch • accurate y-axis label, percentage/% is sufficient • accurate x-axis label with key, where necessary.  

Question	Answer
2.	AO3 = 4   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.

Question	Answer
3.	Award **1 mark** for each of following. • Informative title (1 mark) • Correct labelling of x axis (1 mark) • Correct labelling of y axis (1 mark) • Correct plotting of the results (1 mark)  Accept a stacked bar chart.
4.	**1 mark for each bullet point:** • a bar chart • appropriate X-axis label, e.g. ‘same location and different locations’; ‘Location Conditions’, etc. • appropriate Y-axis label, e.g. ‘Mean/Average number of words recalled (/25).’ Credit axis labels presented the other way around.
5.	**1 mark** for explaining either you need to have continuous data or scores for each participant in order to draw a histogram. Plus: **1 mark** for identifying that the data represents two separate conditions (with music/without music). Accept categorical/nominal. Note: credit can be given for two separate conditions if the student explains clearly why this would make a histogram “inappropriate”.