

THINKING SKILLS

Paper 9694/11
Problem Solving

Key messages

Candidates should be encouraged to show their working and not just write down answers. Most questions are worth more than a single mark, and credit is available for intermediate steps in the working, even though the final answer may be incorrect.

Tidy presentation of work will not only help the candidate to work accurately but will also help the Examiner to follow the thought process of the candidate with a view to being able to award partial credit.

Candidates are provided with answer lines after each part question and they should write their solutions, and not just their final answer on these lines.

When an explanation is asked for in a question where numbers are involved, as is usual on Paper 1, it is almost always the case that candidates should engage with these numbers as the core of their explanation.

General comments

In general, the candidates engaged well with the paper. There were some very good scripts showing an excellent proficiency in problem solving. Most candidates offered good responses to at least some of the questions on the paper. It was particularly pleasing to see that when candidates were not able to solve earlier questions, they persevered and often earned marks in the later questions. As always, candidates are advised to read the questions carefully and take note of each piece of information. It is particularly important to remember that the initial stem of a question applies to the whole of the question.

Comments on specific questions

Question 1

About 40 per cent of the candidates scored full marks for this question. One common error was to work out how long the library was open each day and divide this by 20 minutes to ascertain the number of slots per day. This does not take into consideration the constraints due to the break time, which necessitates the morning and afternoon sessions being looked at separately. Another common error was to give the number of slots available on one computer, ignoring the fact that there are five computers.

Many candidates gave a list of start times for each slot. This approach often led to arithmetical errors. Another common error in this approach was to omit counting the number of slots, simply leaving a list of times.

Question 2

- (a)** This part was usually answered correctly.
- (b)** Many candidates ignored the first words in this part, 'For what range of distances' and attempted instead to answer the question 'Will the new pricing system make less profit than the old one?' This led to numerous different answers based on profit and loss but taking no account of distances. Some candidates simply gave the answer 'yes'.

Of those candidates who attempted to answer the correct question, most were successful in identifying that 60 km was the threshold distance.

(c) Only 20 per cent of candidates gave the correct answer of \$9. Over one-third of candidates omitted this part. The most popular incorrect answer was \$5, usually given without any working to indicate the candidate's thinking.

Question 3

Many candidates had a good grasp of the scenario in this problem.

(a) 50 per cent of candidates answered this part correctly. There were two common approaches. The first and most efficient solution was to add the total playing time (90 minutes), the total gap time between pieces (6 lots of 2 minutes) and the interval time (25 minutes), giving a total of 127 minutes and a finish time for the concert of 21:37. The common error seen in this approach was to add one or two extra gaps of 2 minutes around the interval. The second type of solution involved adding on the duration of each piece and each gap individually, so lists of timings were seen. This approach was fine in principle, but often led to arithmetical slips and a final time that was 1 minute out.

(b) 55 per cent of candidates gave a correct example of how the pieces could be split to achieve the desired equality in the durations of the two halves of the concert. The common error was to give an example with 3 pieces in one half and 5 pieces in the other. While this works with respect to equal durations, it ignores the information given in the stem of the question, that the orchestra will play four pieces in each half.

(c) Less than a third of candidates were successful in this part. Many candidates seemed to understand what was required, but they were not able to deal with the percentages accurately. The most efficient approach is to recognise that the total playing time for the first four pieces is 50 minutes, and then take 5 per cent from this to give Sam's time, together with a similar calculation for Tom's time with 10 per cent added onto 40 minutes. A large number of candidates opted to deal with each piece individually. This led to some tricky decimals and errors in converting these decimals to times.

Some candidates took an easier, incorrect route, believing that a 10 per cent increase on four pieces and a 5 per cent decrease on four other pieces leads to a 5 per cent increase overall, with no consideration of the different durations of the pieces. Other candidates applied the increase and decrease percentages to the intervals as well as the pieces.

(d) The key to solving this part is to realise that the duration of the concert is maximised by having Tom conduct the four longest pieces and Sam the four shortest pieces. A good number of candidates did realise this, but again many ran into trouble in calculating the percentages.

Question 4

(a) Less than half of the candidates obtained the correct date of 27 March. Of these, many had the incorrect day of the week with the correct date, but the mark was still awarded in this situation. It was surprising that candidates did not seem to be able to use a calendar correctly. The start date of Monday 1 March should have led the candidate to realise that 8, 15, 22 and 29 would all be Mondays in March. The most common 'correct' answer was Monday 27 March.

(b) Follow through from the candidate's answer to **part (a)** enabled slightly more candidates to be awarded the marks in this part. The key step is to realise that for Matt and Andy to arrive in Waverley on the same day, Matt must leave Swanley 15 days earlier than Andy. Partial credit was awarded to those candidates who rounded the 15.7 days required by Matt up to 16, rather than down to 15.

Question 5

About one-third of candidates answered this correctly. Most candidates were able to deduce that the maximum amount spent in the shops was for 3 items at \$25 each in 4 shops, giving a total of \$300. The maximum amount per grandchild is when the fewest grandchildren (3) are considered. Adding on the maximum amount \$2 for each of 3 ice creams leads to a total of \$306 which is equivalent to \$102 per grandchild.

The most common incorrect answers were \$302 and \$310. The first of these comes from adding the cost of only one ice cream to \$300, and the second from adding the cost of 5 ice creams to \$300.

Question 6

Many candidates were able to deduce that, since Sally's score was frozen after question number 42, this was her 5th incorrect answer, so she must have either answered correctly or passed 37 questions. The next step proved to be more challenging, as candidates needed to search for a combination of correct answers (worth 5 points each) and passes (a deduction of 2 points each), that would lead to a total of 157. The most common error was to think that 37 was the final answer.

Question 7

(a) 50 per cent of the candidates answered this part correctly. Knowing that each of the five friends spent something, the easiest approach to find the smallest total amount is to say that Clive spent \$1, then David \$2, Harry \$4, Katie \$8 and Angela \$13, a total of \$28. The most common incorrect answer was \$23, coming from allocating \$0 to Clive, with other amounts \$1, \$3, \$7 and \$12, thereby ignoring the instruction that everyone bought something.

(b) About 50 per cent of the candidates found the correct list of five values to take the total amount over \$100, namely \$16, \$17, \$19, \$23 and \$28, but then gave the incorrect answer. This was often \$28 (Angela's amount) or \$103 (the total amount). Candidates should be careful to return to the question to check what is being asked for (Katie's amount) before identifying their final response.

(c) This part was found to be more challenging. The key was to put together the fact that Katie spends twice as much as David and that Katie spends \$6 more than David, the latter from the original stem of the question. The only possibility is that David spends \$6 and Katie \$12. This leads to a total of \$48 for all five friends.

Question 8

(a) Most candidates deduced that Gio's two marks from the judges must sum to 15. As each of the two numbers had to be between 1 and 10, there are three possible pairs: 10 and 5, 9 and 6, 8 and 7. The most common error was to give only one of these possibilities. Another, less common, error was to give a list of all pairs of integers that sum to 15, so 14 and 1, 13 and 2 etc., ignoring the fact that the single maximum score is 10.

(b) Most candidates answered this correctly.

(c) Candidates needed to make a series of deductions using the given information. For Kiran to come 6th in the event, his final score must have been 93, 94 or 95; that is, between 92 and 96. Since Kiran scored 51 for his first dive, he must have scored 42, 43 or 44 for his second dive. Since the difficulty rating for the second dive was a whole number, Kiran's score must be a multiple of 2, 3, 4 or 5. 43 is a prime number, so we have only to consider 42 and 44 with difficulty 3 and 4 respectively. (2 could not produce a sufficiently big final score). Taking into account the score of 6 from Judge 1, the score from Judge 2 must be 8 or 5 respectively.

Many candidates made a good start on this process, and one-third completed it successfully. The common error was to deduce a single possible score of 8 or a single possible score of 5. Some candidates got as far as deducing the possibilities for the score for Kiran's second dive as 42–44, but then abandoned their solution.

Question 9

(a) 50 per cent of the candidates identified at least one way in which a player could win the game in the first turn and, of these candidates, 50 per cent were able to identify all three possible ways.

(b) Only a minority of candidates were able to make much progress in this part. Some identified that after the three turns Sara had 8 marbles but did not know what to do with this information. Some candidates went on to give some of the possible combinations of hiding and guessing numbers, but rarely included all of the possibilities. The common error here was to omit 0 as a valid number of marbles to hide or guess. This led to the incorrect answer of 12.

Question 10

There are two approaches to solving this problem. The first is to identify the total cost of the magazines as \$263, so with his savings of \$65, Ben needs another \$198. Alternatively, Ben has spent \$23 from his savings of \$65 so has \$42 left. He needs to buy another 24 issues of the magazine at \$10 each, so he needs to save another \$198. In either approach, Ben needs to save \$198 in 6 lots of 4 weeks, so \$33 every 4 weeks.

These two approaches were attempted roughly equally by candidates. About one-third of these candidates earned some credit for partial solutions but only 17 per cent were able to complete the solution.

Question 11

One-third of the candidates did not make any response to any part of this question.

- (a) In both parts of this question, about half of the candidates who offered a response gave the correct answers. The common error was to give the total value of the coins rather than the number of coins.
- (b) Only a minority of candidates made a meaningful attempt in this part. The approach was usually to search for the two numbers of coins that satisfied both the weight condition and that there were 100 more 20 cent coins than 50 cent coins. Most searches remained incomplete and were abandoned.

Question 12

This question proved to be very challenging and only a small number of candidates were able to make any progress towards identifying even some of the 27 possible references. Half of the candidates offered no response, and the other half usually wrote down two or three attempts at references, but these were almost always incorrect.

It appeared that most candidates were not able to grasp the scenario. Some misinterpreted 'first letter' as 'a letter in the first position'. Other candidates seemed to write down random incorrect references.

Question 13

This question also proved to be very challenging and very few candidates were able to produce convincing explanations in either part. About 40 per cent of candidates offered no response.

- (a) The explanation required in this part requires only the third of the four given statements, 'every candidate who has a sports card also has a dinner card'. From this it can be deduced that there are not more sports cards than dinner cards. So, there are at least as many dinner cards as sports cards, and possibly more. So, the teacher's claim must be incorrect. Having identified the correct and relevant statement, the common error was to deduce that it implied that there must be equal numbers of sports cards and dinner cards. This is an incorrect deduction and does not imply that the teacher's claim is incorrect.
- (b) Very few valid explanations were seen in this part. The common answer was to state that more information was needed for a decision about false or true to be made. A satisfactory explanation will almost always involve engagement with the numbers of candidates with none or all three of the types of card, given earlier in the question.

THINKING SKILLS

Paper 9694/12
Problem Solving

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General comments

In general candidates engaged very well with the paper. Many candidates attempted most of the questions and there were many answers of a pleasingly good standard. Most of the candidates were able to engage with at least some of the questions in a meaningful way.

Comments on specific questions

Question 1

Most candidates found this a straightforward start to the paper, with the majority giving a correct answer of 1530 minutes or 25 hours 30 minutes or even 1 day 1 hour and 30 minutes. Many of the candidates who did not arrive at the correct answer received some credit for giving a correct expression for the time taken for Kevin to make either the first 10 birdhouses or the second 10 birdhouses.

Question 2

(a) Almost all candidates were able to give one of the 4 possible ways of making six trays of three canapés and a number of candidates gave 2 or 3 of the possible ways. Very few candidates gave all 4 possible ways.

(b) Most candidates correctly answered that another caviar canapé should be made, with many giving a correct reason which was usually based on a possible way given in part (a). Depending on the possibility used, they answered either that there were 2 caviar canapés left over in part (a), so another caviar canapé would enable a whole tray of caviar canapés to be made, or that 1 avocado canapé and 1 salmon canapé were left over in part (a), so another caviar canapé would enable a whole tray mixed of canapés to be made. A minority of candidates tried to explain why a salmon or an avocado canapé should be made.

Question 3

(a) Most candidates answered this part correctly, though a few only indicated the number of bongs in each score and others added the numbers incorrectly.

(b) Almost all candidates gained partial credit for giving at least 4 of the required numbers of points, but very few gave all 7 possibilities, with most, though not all, omitting the possibility that the Dolphins could have scored 0 points.

Question 4

(a) The most common answer to this part was \$34.50, which is the total cost when either one Family, one Group and 2 Child tickets or 2 Family, 2 Adult and 1 Child ticket are bought. Only a minority of candidates identified that the cheapest total cost comes from buying 1 Group ticket (for 5 adults), 5 Child tickets and 1 Adult ticket, for a total cost of \$34.

(b) There were some completely correct answers to this part. Some candidates gave an answer based on Monday–Friday prices rather than the Saturday prices specified in the question, and others found the overall cost of the tickets was \$19.50 but were unable to work out correctly the additional amount given by the local government; partial credit was awarded in each of these cases.

Question 5

(a) (i) This was done well, though some candidates thought that the number of parcels that would fit into one box (6) was the number of boxes required, and ended up with a final answer of \$150. Most candidates did this by consideration of the dimensions of the parcels and the boxes, though some calculated the volume of a box and a parcel and divided – not always correctly.

(ii) Almost all answers correctly explained that the weight of each parcel could be no more than 0.5 kg. However, some candidates gave insufficient answers based on what they were told in the question, for example ‘the parcels were identical’ or ‘the total weight of 6 parcels was 3 kg’.

(b) Many candidates realised that the two parcels could most economically fit into a Type B box and gave the correct answer of \$15.

Question 6

(a) (i) Only a minority of candidates identified that one of the days for training has to be Friday because that is the only day Den works. Wrong answers often pointed out that most people work on Fridays.

(ii) Some correct answers began by eliminating Thursday because it is consecutive with Friday and Monday because there are only 3 people at work that day, before pointing out that the training would have to be done on Tuesday because Ann does not work on Wednesday. Others took a more direct approach by pointing out that Ann and Eva do not work on Friday and the only day they both work is Tuesday. There was a wide variety of answers identifying the wrong day, or giving a partial or an incorrect reason.

(b) This part was answered correctly by many candidates.

Question 7

(a) Most candidates listed the different combinations that could be used, though not all applied the restriction about metals correctly, often ending up with an answer of 10 names needed. Some candidates duplicated the combinations (for example, GZ and ZG), although some compensated for this and arrived at the correct answer. Candidates gained partial credit for listing some correct combinations; this could be done using either the letters G, Z, S, O and A defined in the question or their own recognisable code – usually R, Blu, Bla, Y and W or similar.

(b) This question was found very difficult with many candidates omitting it or getting it wrong. Partial credit was allowed for candidates who forgot the constraint about metals, or who did not use the fact that, for example, the pattern AZS is different from the pattern SZA.

Question 8

This question proved difficult for many candidates. Almost all candidates who made an attempt provided some supporting working, which was required in this question. Two successful approaches were seen. One was to note that the total number of points scored was 98 and that a total of 5 points was available in each of the 20 matches, so no goals were scored in 2 of the matches. The other approach was to work out the number of points each team had gained by scoring first, $4 + 5 + 4 + 2 + 3 = 18$ and subtract this from 20. A number of candidates spoiled their answer by stating that a total of 40 matches were played, or by making arithmetic errors.

Question 9

- (a) Some candidates misunderstood the context here, and gave \$2000 or \$500 as the answer.
- (b) Many candidates found this part difficult and made little or no progress. Some realised they needed to compare the total cash from the first part, \$7100, with the total if all questions had been answered incorrectly, \$6000, but were not sure how to go about it, even though part (a) indicated a way forward. A small number of candidates compared \$6100 with the total cash if all questions were answered correctly, \$8000; this was sometimes carried out successfully.
- (c) Only a small number of candidates worked out correctly that both Sarah and Jason won \$4250 in the second part of the show. Some of those then did not get the correct final answer because they omitted to double Sarah's cash total or they forgot to add in some or all of the cash totals from the first part of the show.

Question 10

- (a) (i) Most candidates answered correctly that the greatest number of trees Toby can prune in a single day is 9, and most pointed out that these were Small trees.
- (ii) Most candidates realised that the greatest amount of money Toby can earn is \$590; this is from pruning 3 Large trees and 1 Medium tree.
- (b) The optimum answer comes by making sure Toby works a full 7 and a half hours on Monday, Tuesday, and Wednesday and then does the rest of the work on Thursday. This means pruning 9 Small trees on one of those full days and 5 Medium trees on the other 2 days, leaving 1 Small tree and 2 Medium trees to be pruned on Thursday. In this case the method of finding the total time, 1580 minutes, and subtracting 3 days (1350 minutes) to leave 230 minutes to be done on Thursday provides the correct answer. Candidates who started by doing 9 Small trees on Monday, and then did the other Small tree on Tuesday before tackling the Medium trees (or vice versa), did not arrive at the correct answer.
- (c) This part proved quite difficult, with only a minority of candidates giving the correct answer.
- (d) In this part the optimum answer comes from Toby working for as long as possible on Monday, Tuesday, Wednesday and Thursday, and the method of finding the total time required and subtracting the time worked in 4 days does not give the correct answer. This is because Toby can only work a complete day on Monday and Tuesday, and that depends on him pruning 3 Large trees and 3 Small trees each day. The next greatest times he can work for are 440 minutes by pruning 11 Small trees in a day, and then 430 minutes by pruning 1 Large tree and 8 Small trees. Only a very small number of candidates gave the optimal answer of 12:10 (on Friday), with rather more gaining partial credit for the sub-optimal answer of 12:20, and many candidates gaining one or more marks for spotting some of the most efficient uses of a single day.

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Candidates found this a challenging question to get completely correct, with many giving answers with repeated digits. Most candidates restricted their answers to 4 (or fewer) dates, but some gave extra wrong dates.

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- (a) Many candidates realised that the answer came from the case where none of those voting against Proposal 1 also voted against Proposal 2, and showed the working $600 - 178 - 163$, or $422 - 163$, or $437 - 178$ to give the answer 259.
- (b) A variety of methods were seen to tackle this part, including Venn diagrams. Many candidates showed the figures 71 or 86 in their working, but not all arrived at the correct answer of 92. This could also be found from $351 - 259$ (the answer to part (a)).

Question 13

Many candidates found this a quite straightforward question; it was often solved using simultaneous equations.

THINKING SKILLS

Paper 9694/13
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THINKING SKILLS

Paper 9694/21
Critical Thinking

Key messages

Although this exam to some extent tests generic skills, which are developed as by-products of the study of other subjects, candidates are expected to have studied the specification, preferably with the aid of the endorsed textbook and with reference to previous question papers and mark schemes. The exam takes it for granted that candidates will know such items as reliability criteria, the specialised meaning of the terms 'argument', 'argument element', 'assumption' and 'analogy', and the names of certain flaws and weaknesses in reasoning.

Candidates should understand that instances of correct evaluation in their answers to parts of **Question 1** may be used to gain credit in their answer to **Question 2** (if used appropriately).

Candidates need to understand the differences between **Question 2** and **5**. **Question 2** asks candidates to what extent they agree with a claim, so they may give a nuanced conclusion. **Question 5** asks them to write an argument to support **or** challenge a claim, so they must aim to persuade the reader to agree with their chosen side. Giving a counter-position and dismissing it with reason may strengthen their argument, but if it is not dismissed then it weakens the candidate's own argument. In **Question 2**, candidates are expected to engage with the sources provided, whereas the content of answers to **Question 5** should be entirely their own ideas and be neither derived from nor in dialogue with the passage used as the basis for **Questions 3** and **4**.

General comments

There was a wide range of performance on this occasion. A few candidates gave impressive answers to most of the questions, while many made more or less successful attempts at them. As in previous sessions, however, many candidates appeared not to know what they were supposed to do.

Most candidates had time to attempt all the questions, but some apparently ran out of time before attempting **Question 5** and perhaps parts of **Question 4**. A fair number of candidates omitted **Question 3(c)** and all or parts of **Question 4** (especially **4(c)**), probably because they did not know how to approach them. Some candidates wrote longer answers to parts of **Question 1, 3** and **4** than was appropriate for the number of marks available for those questions, which may be why some of them ran out of time before completing the exam. It is a particular waste of time to write explanations for answers to **Question 3**, since no marks are available for such explanations.

Several candidates answered the questions in an apparently haphazard order. They are free to do this if they wish, and they are under no obligation to take into consideration the convenience of markers. Candidates who give at least an undeveloped answer to **Question 5** before attempting **Question 4** if they are in danger of running out of time are making a wise choice. However, it would seem unwise to answer **Question 2** before **Question 1** and it must be difficult to hold sections A and B of the exam in one's mind simultaneously.

The handwriting of a significant minority of candidates was so bad that examiners could not be confident that they had interpreted it correctly, despite their best efforts. When spelling and grammar are correct, it is generally possible to decipher a candidate's meaning, even if their handwriting is hard to read, but when all three of these variables are defective it is not possible to use one or two of them to compensate for the other(s).

Comments on specific questions

Section A

Most candidates engaged well with the topic of Section A, on which many of them had significant opinions.

Question 1

(a) Answers expected to this question were based on the five Reliability criteria identified in the specification. Several valid answers based on these criteria were available, and a fair number of candidates achieved full marks on this question. However, many candidates gave answers which did not refer to these criteria and were therefore not credited, such as 'Source E is not reliable, because it is from a post on social media by a random parent,' 'You cannot generalise from a single 10-year-old boy to all children' and 'Just because he doesn't like math does not mean he shouldn't have to learn it.' Several candidates criticised Source E for the absence of statistics. Other inadequate answers made summary judgments based on Reliability criteria, without explaining how they applied to Source E.

(b) Most candidates correctly judged that Source C was an argument, but relatively few correctly identified the conclusion, with the result that more candidates were awarded 1 mark than 2. Many of those who gave the correct judgment were awarded 0 marks, because their answer showed no understanding of the nature of an argument. The term 'claim' as an alternative to 'conclusion' is accepted by Examiners, although the latter is preferred; however, some candidates seemed to think they were different things, saying for example that the source had a claim but not a conclusion or both a claim and a conclusion. Some candidates made comments which were apparently based on a wrong understanding of the word 'argument', stating, for example, that Source C was not an argument because it expressed only one side, or did not include a counter or rebuttal. More candidates than on previous occasions appeared not to know that an argument consists of a persuasive conclusion supported by reasoning.

(c) Most candidates made correct judgments in response to this question and justified their judgments well. A significant minority exceeded the requirements for achieving full marks. However, many candidates misunderstood the expression 'reliably conclude' and assessed the reliability of the source instead of the inference, while others misunderstood the question and stated either that parents could avoid sending their children to school by homeschooling them or that they could avoid educating their children by employing a tutor to do it for them. Some candidates lost the mark for a judgment because they said it could be 'quite reliably' concluded but subsequently inferred that 'parents can therefore avoid educating their children,' which would have earned the judgment mark if they had not already contradicted it.

(d) Many candidates suggested plausible explanations for why the test scores of homeschooled children might have been higher than those of school pupils even if the education they received was not superior. The most popular valid answers referred to comfort, lack of stress and the possibility of cheating. A fairly popular but puzzling wrong approach was to suggest that more or fewer homeschooled than schooled children might have taken the test. As on previous occasions when questions of this type have been asked, many candidates overlooked, ignored or misunderstood the qualifier 'alternative' (even though it was highlighted on the question paper), and suggested reasons why home-based education might have been more effective, which is not what the question asked. Questions of this kind are one of the points at which Thinking Skills impinge most pertinently upon daily life and so it is strategic that this skill be taught and tested. Candidates should learn to recognise questions of this type and practise answering them.

(e) A fair number of candidates identified one or other of the potential points of significance, which could be expressed in many different ways. However, not many spotted that this source could have completely different significance when considered from different perspectives. Many candidates summarised or even quoted the content of Source C as their answer, instead of explaining its significance: such answers were not credited.

Question 2

Although a few candidates supported the claim provided, more opposed it and many took an intermediate position. Almost everyone who claimed that 'All children should not (be compelled to) attend school' meant that 'Not all children should (be compelled to) attend school.' Some candidates apparently misinterpreted the

claim as meaning that all children should be compelled to be educated; they then argued in favour of allowing homeschooling as an option, which was at variance with their stated conclusion that all children should be compelled to go to school. Conclusions which were not supported by the reasoning in this way were not credited. A few candidates misinterpreted the claim as meaning that all children should feel psychologically impelled to go to school.

The key to achieving higher marks in tasks of this kind is to evaluate sources and draw pertinent inferences from them, and on this occasion a good proportion of candidates attempted to do this, with varying degrees of success. There were some good instances of inferential reasoning. As on previous occasions, however, many did no more than simply relate some or all of the sources to the claim, thereby achieving 2 or 3 marks out of 8.

A few candidates summarised the sources and then derived a conclusion 'out of thin air', without any relation to the sources: such conclusions were not credited. Some weaker answers unrealistically cited Source E without reservation as evidence of the benefits of home schooling. Some candidates made unrealistic claims about the data recorded in Source B, apparently because they did not understand the y-axis; very few if any drew attention to the fact that the results applied only up to the age of 10 or that the subjects tested were biased in favour of academic skills, which made it inevitable that 'unschooled' children would perform relatively badly (the results might have been different if the tests had included domestic or agricultural skills).

Although the main focus of this question is on the use of the sources, 2 marks are available to candidates who include some independent thinking in their answers, and on this occasion several candidates made good use of their own knowledge, opinions or experience. However, some candidates relied entirely on their own thinking, making no use of the sources, which severely limited the mark they could achieve.

Section B

As on some previous occasions, many candidates seemed to struggle to analyse and evaluate an argument with which they had very little sympathy. As stated in the specification, arguments presented in this exam are composed for the purpose of analysis and evaluation, and do not necessarily express the actual opinion of either the author or Cambridge.

Question 3

- (a)** Most candidates spotted that the main conclusion was included in the first sentence, but some of them quoted the whole sentence instead of only the second half and thereby lost a mark. A few candidates offered wrong answers, the most popular of which were all or part of the last sentence of paragraph 1 and the first sentence of paragraph 6.
- (b)** Many candidates correctly identified the first intermediate conclusion on the mark scheme, but some of them lost a mark because their quotation was incomplete. Fewer candidates identified the second IC on the mark scheme, and some of those forfeited both marks because they included two additional elements. Many candidates identified the third answer on the mark scheme, but most of them included the preceding clause (beginning 'Although...') and were therefore awarded 1 mark instead of 2. Separating the argument element from other parts of the sentence is part of the skill being tested in this question. Various wrong answers were also offered.
- (c)** A significant minority of candidates achieved one or both marks for this question, but there were some wrong answers (such as 'intermediate conclusion' and 'counter-assertion'). Most candidates apparently did not know what the expression 'argument element' meant (although it frequently occurs in this position in the exam) and therefore quoted or paraphrased the paragraph or identified an alleged flaw in its reasoning instead of identifying an argument element and explaining its function.
- (d)** A few candidates succeeded in identifying an unstated assumption, but – as on previous occasions – many quoted from the passage or paraphrased its content, not realising that answers of those kinds cannot constitute 'unstated' assumptions. By far the most popular answers were that the doctors who recommend investigations or treatments have not experienced them personally and that they do not understand how unpleasant or inconvenient they are, both of which are stated in the passage. Another popular wrong answer was that all medical procedures are unpleasant and inconvenient. Other incorrect answers were implications of the reasoning, rather than a missing step within it.

Question 4

(a) Most of the candidates who identified an appeal named the final clause of the paragraph correctly as appeal to emotion (or fear or pathos), but a significant minority wrongly claimed that the first sentence of paragraph 1 embodied an appeal to authority, expertise or popularity. Other incorrect answers included 'appeal to pity' and 'slippery slope' (which was, however, credited as a valid evaluative point). Many candidates did not identify an appeal at all, and either quoted or paraphrased the content of the paragraph or expressed their own agreement or disagreement with it. Not many candidates attempted to gain the other 2 marks available, and those who did make such an attempt tended to claim that the appeal strengthened the author's reasoning, instead of recognising that it would better support the reasoning of anyone opposing this argument.

(b) Many candidates made at least one of the evaluative points identified on the mark scheme. As on previous occasions, candidates were inclined to judge that the analogy was a bad one because the two things being compared were different, but no mark was awarded for this. Some quoted or explained the analogy without evaluating it: unfortunately for them, no marks were allocated to this. A few candidates referred to the wrong part of the paragraph, presumably because they did not know what an analogy was.

(c) A few candidates successfully identified one or other of the two instances of conflation in paragraph 3 and a few achieved a mark by focussing their explanation on the concept of benefit. However, most candidates attempted to criticise or argue against the reasoning in that paragraph without reference to conflation (although some of them did use that word, in a variety of apparent senses). This suggested that they did not know the meaning of this technical term. Several candidates actually made comments like, 'I don't know what conflation is, sorry.'

(d) Most candidates understood that there was a problem in claiming that 'We ourselves are the greatest experts on what is happening in our own bodies', but very few succeeded in explaining the problem in terms of a 'flaw' or 'weakness' from the specification, even though they had four correct answers to choose from. A fair number of candidates succeeded in drawing a distinction between subjective sensations and understanding or diagnosis of medical conditions. However, the most popular approach was simply to deny that 'We ourselves are the greatest experts on what is happening in our own bodies,' without engaging with the author's reasoning in support of this unlikely claim: this was not credited. Another approach which was not credited was to describe the reasoning in paragraph 6 as a circular argument.

Question 5

Candidates seem to have found this a harder topic than on some other occasions, and they tended to write less. This did not necessarily disadvantage them. As demonstrated in the published example 8-mark answers in every session, answers to **Question 5** do not need to be very lengthy in order to achieve full marks. Two strands of reasoning, each including two reasons and one or two argument elements and each leading to an intermediate conclusion, are sufficient. To spend time thinking about an answer is usually a more successful strategy than setting pen to paper immediately.

A wide variety of standards was achieved. Many answers were well structured, while others consisted of a single stream of consciousness. Many candidates explained why they agreed or disagreed with the claim, instead of either supporting or challenging it.

Many candidates argued in separate strands of reasoning and a fair number made appropriate use of 'additional argument elements' (examples, evidence, analogies, counters with response or hypothetical reasoning). Although some candidates constructed their strands of reasoning to support intermediate conclusions, relatively few used argument indicator words to identify those intermediate conclusions.

On this occasion, more candidates than usual supported their reasoning by reference to what appeared to be spurious research projects, most of which made implausible or incoherent claims: these were not credited. More credible evidence consisted of (alleged) personal experiences of candidates or their families. Several candidates coincidentally made use of the same pertinent analogy, of the instructions to see to one's own oxygen supply before helping others, in the event of an emergency on an aircraft.

Many low-scoring answers were brief and undeveloped and some were vague, trite and repetitive. The standard advice that candidates should plan their answer before beginning to write was particularly pertinent on this occasion.

Some answers consisted mainly of rhetorical questions, which were not credited. Some candidates achieved very low marks because they discussed how to put the claim into practice, instead of reasoning to support or challenge it. Other very weak answers were based on a false distinction between giving priority to one's own health and consulting doctors.

THINKING SKILLS

Paper 9694/22
Critical Thinking

Key messages

Although this exam to some extent tests generic skills, which are developed as by-products of the study of other subjects, candidates are expected to have studied the specification, preferably with the aid of the endorsed textbook and with reference to previous question papers and mark schemes. The exam takes it for granted that candidates will know such items as reliability criteria, the specialised meaning of the terms 'argument', 'argument element', 'assumption' and 'analogy', and the names of certain flaws and weaknesses in reasoning.

Candidates should understand that instances of correct evaluation in their answers to parts of **Question 1** may be used to gain credit in their answer to **Question 2** (if used appropriately).

Candidates need to understand the differences between **Questions 2** and **5**. **Question 2** asks candidates to what extent they agree with a claim, so they may give a nuanced conclusion. **Question 5** asks them to write an argument to support **or** challenge a claim, so they must aim to persuade the reader to agree with their chosen side. Giving a counter-position and dismissing it with reason may strengthen their argument, but if it is not dismissed then it weakens the candidate's own argument. In **Question 2**, candidates are expected to engage with the sources provided, whereas the content of answers to **Question 5** should be entirely their own ideas and be neither derived from nor in dialogue with the passage used as the basis for **Questions 3** and **4**.

General comments

Most candidates attempted to answer all the questions. Where questions were omitted, this was sometimes when candidates had written a great deal in the earlier parts of the paper, suggesting that they had simply run out of time to complete it.

Candidates often answered questions in an order different from that on the question paper. When doing so, they usually answered all the questions, but a minority omitted questions with no sign that this was deliberate. Perhaps they would have tried to answer the missing questions had they realised that they had left them unanswered. It is important to check that all questions have been attempted.

Comments on specific questions

Section A

Question 1

(a) Most candidates recognised that Source B was not an argument, often going on to state that it did not have a persuasive conclusion or reasoning to support such a conclusion. This 'generic' description of Source B gained a mark, but to get full credit it was necessary to state what the source was actually doing instead of proffering an argument. Many candidates found it difficult to do this clearly, although there were some very good, concise accounts of the function of Source B.

Relatively few candidates made the error of stating that the source was not an argument because it did not include a counter-claim, or words to that effect, thereby showing that they were not operating with the correct sense of 'argument'. Responses along these lines did not receive any credit.

(b) Responses to this question indicated that many candidates have been well-drilled in the reliability criteria, as listed in the specification. Some made points about the lack of representativeness of the source, thereby not responding to the question; but, even in these cases, a few still obtained two or three marks by correct application of the relevant criteria.

There was sometimes a mismatch between the judgment offered as to the source's reliability and the points made in the remainder of the response. For example, some candidates judged that the source was 'fairly' or 'quite' reliable, despite their identification of several of the criteria that made Source D highly reliable. In some instances, candidates may have been misled by their criticisms of the source's representativeness. In others, perhaps candidates were reluctant to commit to a strong judgment and settled for something rather too weak for credit.

(c) Credit was most frequently awarded for making the first, third and fifth points in the mark scheme. Most candidates were able to give creditworthy versions of these points. It was possible to make them in a concise way, but candidates often went to considerable lengths to articulate a criticism that could have been made more quickly and easily. Some went astray and tried to apply the reliability criteria to the source.

(d) Collectively, the candidates managed to obtain credit by making nearly all the points on the mark scheme, albeit to varying degrees of precision. Some did not realise that simply summarising Source B was not enough to respond to the question. They needed to focus their responses more on the detail of the material covered in the sources.

Although there was no mark for a correct judgment for this question, there were 11 ways of obtaining a single mark, and there were some very good 3- and 4-mark responses.

(e) Many candidates identified that the sources used different group sizes and different ages (or levels of maturity), but did not get credit because they did not make these distinctions explicit. It was not enough to state, for instance, that Source A was about university students, whereas Source D was about young teenagers; that information was in the sources. To gain credit, it was important to highlight the significance of this difference.

A few misread either Source D or the question itself. The former misinterpreted the teacher as agreeing with the opening sentence of the source, despite what follows it; the latter misread the question as asking why the sources are not consistent.

Question 2

The majority of responses agreed with the claim given in the question, although many qualified their agreement in some way. Some candidates were personally sympathetic to the idea of collective working being better than individual efforts, whereas others accepted the implications of the various pieces of source material, especially Sources A and B.

As with **Question 1(b)** above, it was clear that many candidates have acquired a good grasp of the various reliability criteria, and were able to apply them to the four sources. However, some candidates did not focus their evaluative points adequately. For example, it was not enough to say that a given source may have expertise; it was important to say what the nature of this expertise is.

A typical response involved a statement of the candidate's conclusion, use of three or four sources, and some evaluation. In connection with the latter, many candidates made use of evaluative points – pertaining either to reliability or to quality of reasoning – that they had imported from **Question 1**. This is a practice to be encouraged.

A few candidates misunderstood the task, neither using nor evaluating the source material, but instead offering their own thoughts on the topic. Such responses can get no more than three marks – one for the conclusion and two for personal thinking.

Section B

Question 3

- (a) A significant majority of candidates obtained both marks for this question. A few erroneously identified the first part of the second sentence of paragraph 6. Although this looked similar to the correct answer, it was clearly functioning as a reason here, and no credit was given for citing it in response to this question.
- (b) There were many 4-mark responses to this question. The most common error was to quote the whole of the final sentence of paragraph 2. As this contains two intermediate conclusions, only a single mark could be awarded; however, candidates who made this mistake usually identified the first sentence of paragraph 4 as a second intermediate conclusion, thereby obtaining three marks out of the four available.
- (c) Many candidates obtained credit here, usually for citing the third counter-assertion listed in the mark scheme.
- (d) Most candidates identified the words cited in the question as examples, gaining the first mark available. Some obtained the second mark by completing the identification by saying what was being exemplified. Occasionally, candidates made two attempts at naming the argument element, reducing the credit available for a fully correct response to one mark.
- (e) Approximately half of the candidates identified one of the assumptions listed on the mark scheme, usually the second one, although several versions of the first one were seen. The other half stated that various assumptions were being made about people primarily engaged in 'brain work'. These were not credited. The reasoning in the passage was about manual workers, and it was to this reasoning that candidates were expected to direct their efforts to find the unstated 'link'. The material about 'brain workers' was incidental to the reasoning and could easily have been omitted from the paragraph.

Very few candidates made the error of quoting words from the passage as a response to this question.

Question 4

- (a) As so often happens with questions about appeal, various identifications were attempted, with wrong answers including 'emotion' and 'authority'. Most candidates identified the appeal as being either to history or tradition. The latter closed off the possibility of a second mark for evaluation. Some candidates offered both, thereby sacrificing the possibility of the first mark available.

Unusually, this appeal could be evaluated in different ways, as outlined in the mark scheme. There were some very good evaluations offered by candidates, most of which stated that the appeal was weak, citing the development of more efficient, mechanised means of meeting our most basic needs. However, many candidates confined themselves merely to describing the appeal, which was not what they had been asked to do.
- (b) Not many candidates identified the flaw in paragraph 3 as a straw man. They were more likely to regard it as a flaw of personal attack (*ad hominem*) – a response for which only one mark was available. Of the few who correctly identified the flaw, only a handful were able to explain that it was misrepresenting a potential opponent's argument in order to make it easier to rebut.

The most popular wrong answer was to claim that an unwarranted generalisation had been made, although the passage only states that some people take this extreme view of what counts as 'valuable' work. Another popular wrong answer, although less seen than the foregoing, was to claim that the author of the passage was making a flawed assumption about 'brain' workers.
- (c) There were two ways of getting credit for identifying what was being conflated. These were seen in roughly equal measure. The most common incorrect answer was to claim that 'brain chemistry' was being conflated with 'mental health'. Of the many candidates who correctly described the conflation, not very many were able to say why it was a problem for the reasoning. Some claimed that manual work is more strenuous and physically demanding than regular physical exercise (of

the type performed at a gym); but, while undoubtedly true in some circumstances, this was not credited, as it did not adequately explain the problem with the reasoning.

(d) Many candidates correctly identified the problem with the reasoning in paragraph 6 – either by describing it as ‘circular reasoning’ or, less commonly, as ‘begging the question’. (Although these are listed as separate flaws in the specification, for the purposes of this question either was deemed acceptable.) The most commonly seen wrong answer was the claim that the flaw was one of restricting the options.

Most people who had identified the flaw found it rather harder to explain what the problem was, and so missed the second mark available. They seemed to be aware intuitively of what was wrong, but couldn’t articulate it clearly and effectively. A few candidates gave a clear explanation of the flaw, but misnamed it. They received a single mark for their explanations.

Question 5

Most responses supported the claim given in the question. There were some excellent arguments offered for support or challenge, with candidates giving strong reasons why either enjoyment or high pay should be accorded greater importance in one’s working life.

Some candidates, perhaps influenced by other school subjects, prefaced their answers with preludes – sometimes rhetorical – that went beyond merely stating what they intended to argue. These were often articulate and interesting, but took up valuable writing time. Candidates would be better to draft a plan – which many did – and then to start writing their arguments without any preamble.

Candidates sometimes merely listed reasons to support their chosen conclusion. Good examples were often included with the reasons, but there was a very simple structure to the arguments, and this limited the marks that could be awarded. In particular, more use could be made of intermediate conclusions. These allow more sophisticated arguments to be written.

Sometimes, candidates allowed themselves to be sidetracked. For example, when arguing that workers who enjoy their jobs are usually more motivated and efficient at what they do, some people were diverted into the benefits for the economy – a point that they occasionally developed at unnecessary length.

As outlined in the key messages at the beginning of this report, candidates need to be aware of the difference between **Question 2** and **Question 5**. The relevance of this distinction here is that marks for **Question 5** are capped at six unless a candidate gives the conclusion as stated in the question. Some otherwise very good responses were capped for this reason.

Almost no candidates made the error of using material from the passage.

THINKING SKILLS

Paper 9694/23
Critical Thinking

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the type performed at a gym); but, while undoubtedly true in some circumstances, this was not credited, as it did not adequately explain the problem with the reasoning.

(d) Many candidates correctly identified the problem with the reasoning in paragraph 6 – either by describing it as ‘circular reasoning’ or, less commonly, as ‘begging the question’. (Although these are listed as separate flaws in the specification, for the purposes of this question either was deemed acceptable.) The most commonly seen wrong answer was the claim that the flaw was one of restricting the options.

Most people who had identified the flaw found it rather harder to explain what the problem was, and so missed the second mark available. They seemed to be aware intuitively of what was wrong, but couldn’t articulate it clearly and effectively. A few candidates gave a clear explanation of the flaw, but misnamed it. They received a single mark for their explanations.

Question 5

Most responses supported the claim given in the question. There were some excellent arguments offered for support or challenge, with candidates giving strong reasons why either enjoyment or high pay should be accorded greater importance in one’s working life.

Some candidates, perhaps influenced by other school subjects, prefaced their answers with preludes – sometimes rhetorical – that went beyond merely stating what they intended to argue. These were often articulate and interesting, but took up valuable writing time. Candidates would be better to draft a plan – which many did – and then to start writing their arguments without any preamble.

Candidates sometimes merely listed reasons to support their chosen conclusion. Good examples were often included with the reasons, but there was a very simple structure to the arguments, and this limited the marks that could be awarded. In particular, more use could be made of intermediate conclusions. These allow more sophisticated arguments to be written.

Sometimes, candidates allowed themselves to be sidetracked. For example, when arguing that workers who enjoy their jobs are usually more motivated and efficient at what they do, some people were diverted into the benefits for the economy – a point that they occasionally developed at unnecessary length.

As outlined in the key messages at the beginning of this report, candidates need to be aware of the difference between **Question 2** and **Question 5**. The relevance of this distinction here is that marks for **Question 5** are capped at six unless a candidate gives the conclusion as stated in the question. Some otherwise very good responses were capped for this reason.

Almost no candidates made the error of using material from the passage.

THINKING SKILLS

Paper 9694/31
Problem Analysis and Solution

Key messages

The instructions clearly state that ‘in some questions, if you do not show your working, full marks will not be awarded.’ The title of this paper is ‘analysis and solution’, not just solution. Some candidates continue to use the answer booklet just for the final answers, which means that they cannot be awarded partial credit which might have been earned in their full solution.

General comments

Many candidates would benefit from pausing to consider if the answer they have given matches the sizes and units of the question; there has been an improvement on answers where the number is well out of range, but when there are said to be 4, and 4 are asked for, giving 5 should flag the need for reconsideration.

Some candidates crossed out their working leaving only the final answers, which is unhelpful whenever working is required for full marks. Only working that has been replaced should be struck through.

Most candidates gave a response to all parts of all questions. A few did not complete the last question they did. There seemed to be more variety in the order chosen than previously, with many skipping parts and coming back later. In a few cases the parts almost seemed randomly chosen, but this led to more than one response to some parts. Anything that has been replaced does need to be crossed out.

Comments on specific questions

Question 1

- (a) Almost all candidates found the smallest difference; but not all of them then worked out the smallest cost.
- (b) Many of the higher-scoring candidates rushed this part and did not get the answer. It was common for candidates to do a 3-way split but then split 3 ways again.
- (c) Many candidates did not handle the 2-minute walking correctly. Some wasted time with a laborious set of additions (sometimes as many as 36), often with arithmetic slips, particularly if they used time of day rather than just considering it as a period of 330 minutes.
- (d) ‘Explain your answer’ calls for at least some words embellishing a calculation. Some candidates only offered variations on the tautology ‘Yes there is now enough time’.

Question 2

A system of identifying squares was given, which some candidates ignored, offering e.g. 'the one remaining grey square'. Some appear to have thought that the notation only applied when the square was occupied, offering answers such as 'the square to the right of Eb'. A few candidates had the right numbers but did the wrong operations with them, such as squaring instead of doubling, or multiplying instead of adding.

- (a) Many candidates took note of the limitation of '4 adjacent' or 3 shaded to get the answer of 7. Some just offered 3 or 4, or ignored the constraints and included all the squares except the one already occupied (35).
- (b) Most candidates saw that the highest score should be on the shaded square to double it, but a few ignored the bolded reminder that the numbers had to be different.
- (c) (i) Some candidates used the number of squares ($36/3 = 12$) without noticing the lower limit resulting from there being only 28 counters.
 - (ii) Few candidates used the reasoning shown in the mark scheme, and while most of them started with considering four cases of the previous answer, filling in the rest was rarely systematic nor error-free. Not all checked that the numbers they included could be grouped into valid triples, e.g. appending +1+1+1.
- (d) (i) Most candidates stated both the correct point score and the location; some just gave one or the other.
 - (ii) Most candidates gave the correct square, although many went on to make further commentary, which wasted time and is in danger of obscuring their final answer.
- (e) (i) Most candidates gave the score and found some, but not all, of the five possible places.
 - (ii) Few candidates correctly located these squares.
- (f) A few candidates offered options when only one answer was envisaged, gaining some credit when including the right answer, but possibly not considering that there must be some constraint that had been overlooked (often the need for the values to be distinct). Some correctly noted that all the 4s were taken, but still offered a response with a 4.

Question 3

- (a) Many candidates attempted to answer the harder question of which singers, not just how many, which was all that was asked. The answer was rarely found from just using simple arithmetic. Some noted it must be B or H (and being equal they could not be distinguished). A few simply asserted it was e.g. H (and A and G) and so there were 3. 2 was a common choice.
- (b) Almost all candidates identified B as the lucky survivor, with C as second-favourite response.
- (c) Some candidates suggested that those with an odd number of points must have had a bonus for that reason. Many just identified some or all without any explanation.
- (d) Some candidates offered sets with different numbers of singers, which could not be correct. A third gave no response. Many asserted that A would get a bonus, and so did not consider the option F, C, D.

Question 4

Although some candidates noted that they had run out of time and guessed the last few parts, many showed just numbers and symbols in their working. A narrative is not required, but some labelling of items would have reduced the scope for getting tangled, especially with whether things should be added or subtracted. Some candidates offered a blizzard of unidentified numbers and seemed unaware that examiners are not allowed to use their mind-reading skills.

- (a) Many candidates were awarded the 2 marks for this question, although numerous candidates gave the simple calculation that $60 \times 8 = 480$, entirely ignoring the subtlety of the method of allocation and the varying times for different tasks. A six-day laptop repair could be involved but then only two services. Some candidates arrived at the wrong answer here or in the next part by arithmetic error, e.g. $60 \times 8 = 440$, impacting the answers to later parts (even with the most generous follow-through). A few candidates offered \$220 without explanation. Some calculated various amounts, including the correct answer, and then chose another, larger amount instead of the minimum.
- (b) Far fewer candidates gave the correct answer to this than part (a). Again, just $100 \times 8 = 800$ was offered by many, without considering that laptop repairs could only start on the first three hours and tablet could not start on the last two.
- (c) Some candidates did not get the hint from the 3 marks available that the answer is not as simple as 'No, it's the same amount of work each week'. Some candidates did not include the cost reduction from the reduced numbers of days. Some gave an unsupported Yes, others just No, and many considered only the difference in costs or only the increased minimum income.
- (d) Some candidates confused hourly, daily and weekly rates, but more did not correctly handle income and expenditure, e.g. by adding them.
- (e) Many candidates did not provide a response to the last two parts, and some of the responses were probably guesses, although a few noted that their working was on the question paper, which is not seen by examiners.
- (f) For those who attempted this part there was a wide range of approaches, some much more complicated than others. A few candidates offered final answers which were less than the current pay rate. Many just wrote an answer with no working. A few rounded their worked answer to the nearest dollar, not necessarily rounding in the appropriate direction to keep a residue of at least 200.

THINKING SKILLS

Paper 9694/32
Problem Analysis and Solution

Key messages

The instructions clearly state that 'in some questions, if you do not show your working, full marks will not be awarded.' The title of this paper is 'analysis and solution', not just solution. Some candidates continue to use the answer booklet just for the final answers, which means that they cannot be awarded partial credit which might have been earned in their full solution.

General comments

The examination is testing skills; the examiners already know the answers, which are an essential part of a complete response, but more is often needed. Candidates should use the hints available: 3 marks indicates that there will be at least 3 steps in the solution. Strange numbers in the question are probably chosen to give something close to or on a threshold: If it says 11 minutes and the candidate does not have something significant between 9 and 13 then it might be worth checking that all the constraints have been considered.

Comments on specific questions

Question 1

- (a) Most candidates identified the correct cars.
- (b) Despite noting 5 cars at 11:00 in the previous part, some candidates offered 3 or 4 for the maximum. Some omitted to mention the time or the number.
- (c) Most candidates noted the correct pair, although some gave more than two answers.
- (d) Most candidates found the correct answer.
- (e) Most candidates listed all the free parking correctly.
- (f) Only half of the candidates calculated the correct amount.
- (g) One in five did not attempt this part. Working was sometimes missing.

Question 2

Most candidates correctly handled the important detail that there are only 60 minutes in an hour, so 200 minutes is more than 2 hours. Some candidates did not consider the requirement to be within 200 minutes of a high tide at all times away from the dock, not just the departure.

- (a) Most candidates tried to tie down the start time and then work from there, instead of just looking at the overall length (in minutes). Many assumed that it started at 09:30, which suggested they had not understood the scenario. Few candidates took account of the possible 9 minutes of slack between the appointed time and the first multiple of 10, and at least one sought *distinct* multiples of 10.
- (b) (i) Most candidates found the latest possible time.
(ii) Very few candidates derived this limit; there was no consistent error.

(c) One candidate offered an unusually sophisticated approach by presuming the question was well-posed and noting there would be a non-negative whole number of children:
 $(4n \times 16 - 1618)/(16 - 10)$. Many candidates made the question impossible to answer by adding an assumption that there would be the same number of children each day, so only a few found the answer: some by trial and improvement and a few using algebra.

(d) (i) Many candidates showed a start at 09:30 although that was not possible on the relevant day.

(ii) Many candidates listed the dates when he would **not** be able to start at 09:30. A quarter gave no response.

(e) Some candidates did not take account of the change to multiples of 5 minutes rather than 10. This was another case where the way the question is written hints that it is a borderline case, and without the change the answer might be different.

Question 3

Some candidates gave explanations based on the scenario rather than the data provided, e.g. letters would need to be typed before the documents were filed.

(a) Some candidates gave answers which did not rely on the data but could be constructed from the question, e.g. 'if you take the cheapest worker from the first two no one will be available for the third'. The explanation needed to be tied to this case with at least the relevant names.

(b) Two-thirds of candidates answered this correctly. Apart from arithmetic errors, the most common omission was the constraint that each person only did one thing.

(c) This question was looking for an explanation as to why an item was first in the list. Many candidates only indicated that it was not last, which was necessary but not sufficient.

(d) This question called for an explanation of how it was determined, not just a confirmation that the chosen answer could be last.

(e) (i) Some candidates correctly offered two of the values and gave the basic rate, but did not then complete the question by giving the remaining two values (each of which needed just a trivial subtraction). Some gave the basic rate as the final answer.

(ii) Some candidates did not note that a worker would need at least one skill to be employed.

Question 4

There were three states ('power ratings') and it was necessary to track which state applied at each point. (Candidates were not required to know it, but it was a simple example of finite state machine.) There were only four possible numbers involved at any stage: 0,1,3,6, but some candidates still managed to introduce a 2 or other digit.

(a) Only two in five candidates found the highest and lowest. Some gave the same number for both.

(b) Those who answered 4(a) correctly almost all worked this out, but a few omitted consideration of the implication of the other two candidates needing to be eliminated.

(c) Finding the valid sequence that was both 11 long and added to 13 proved challenging, particularly in getting the appropriate numbers of 0s at the end.

(d) (i) Many responses offered just an answer. The wide range of such responses suggests that from here on many were simply guessing what they considered a plausible value.

(ii) Some of the random answers to this part clearly did not use the information in the following part, from which it can be seen that this answer cannot be more than 11.

- (iii) A quarter of candidates did not offer a response. Some ignored simple constraints such as starting in 'Bronze'.
- (e) Very few candidates made progress with this part, especially the final twist that eliminating one gives more to the other.

THINKING SKILLS

Paper 9694/33
Problem Analysis and Solution

Key messages

The instructions clearly state that ‘in some questions, if you do not show your working, full marks will not be awarded.’ The title of this paper is ‘analysis and solution’, not just solution. Some candidates continue to use the answer booklet just for the final answers, which means that they cannot be awarded partial credit which might have been earned in their full solution.

General comments

The examination is testing skills; the examiners already know the answers, which are an essential part of a complete response, but more is often needed. Candidates should use the hints available: 3 marks indicates that there will be at least 3 steps in the solution. Strange numbers in the question are probably chosen to give something close to or on a threshold: If it says 11 minutes and the candidate does not have something significant between 9 and 13 then it might be worth checking that all the constraints have been considered.

Comments on specific questions

Question 1

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Question 2

Most candidates correctly handled the important detail that there are only 60 minutes in an hour, so 200 minutes is more than 2 hours. Some candidates did not consider the requirement to be within 200 minutes of a high tide at all times away from the dock, not just the departure.

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 $(4n \times 16 - 1618)/(16 - 10)$. Many candidates made the question impossible to answer by adding an assumption that there would be the same number of children each day, so only a few found the answer: some by trial and improvement and a few using algebra.

(d) (i) Many candidates showed a start at 09:30 although that was not possible on the relevant day.

(ii) Many candidates listed the dates when he would **not** be able to start at 09:30. A quarter gave no response.

(e) Some candidates did not take account of the change to multiples of 5 minutes rather than 10. This was another case where the way the question is written hints that it is a borderline case, and without the change the answer might be different.

Question 3

Some candidates gave explanations based on the scenario rather than the data provided, e.g. letters would need to be typed before the documents were filed.

(a) Some candidates gave answers which did not rely on the data but could be constructed from the question, e.g. 'if you take the cheapest worker from the first two no one will be available for the third'. The explanation needed to be tied to this case with at least the relevant names.

(b) Two-thirds of candidates answered this correctly. Apart from arithmetic errors, the most common omission was the constraint that each person only did one thing.

(c) This question was looking for an explanation as to why an item was first in the list. Many candidates only indicated that it was not last, which was necessary but not sufficient.

(d) This question called for an explanation of how it was determined, not just a confirmation that the chosen answer could be last.

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(ii) Some candidates did not note that a worker would need at least one skill to be employed.

Question 4

There were three states ('power ratings') and it was necessary to track which state applied at each point. (Candidates were not required to know it, but it was a simple example of finite state machine.) There were only four possible numbers involved at any stage: 0,1,3,6, but some candidates still managed to introduce a 2 or other digit.

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(b) Those who answered 4(a) correctly almost all worked this out, but a few omitted consideration of the implication of the other two candidates needing to be eliminated.

(c) Finding the valid sequence that was both 11 long and added to 13 proved challenging, particularly in getting the appropriate numbers of 0s at the end.

(d) (i) Many responses offered just an answer. The wide range of such responses suggests that from here on many were simply guessing what they considered a plausible value.

(ii) Some of the random answers to this part clearly did not use the information in the following part, from which it can be seen that this answer cannot be more than 11.

- (iii) A quarter of candidates did not offer a response. Some ignored simple constraints such as starting in 'Bronze'.
- (e) Very few candidates made progress with this part, especially the final twist that eliminating one gives more to the other.

THINKING SKILLS

Paper 9694/41
Applied Reasoning

Key messages

In **Question 1**, candidates are expected to quote directly from the text in the document. It is acceptable to use ellipsis (...), so long as the start and end points are completely unambiguous.

In **Question 2**, candidates are expected to evaluate the reasoning in the document with reference to the flaws and weaknesses listed in the syllabus. Responses that simply dispute the reasons given in the argument, or generic statements such as 'there is no evidence to back this up' or 'we do not know the source', are unlikely to gain any credit.

In **Question 3**, candidates are expected to evaluate the validity of inferences that might be drawn from data in some form. Responses that simply question the source of the data or speculate about the sample size are unlikely to gain any credit.

In **Question 4**, candidates are expected to create their own argument structure, rather than follow the sequence of the documents. They should structure their arguments clearly, using indicator words such as 'because', 'so' and 'therefore' to identify intermediate conclusions, and make use of other argument elements to support their reasoning.

Candidates are asked to write an argument to support **or** challenge a claim, so they must aim to persuade the reader to agree with their chosen side. Giving a counter-position and dismissing it with reason may strengthen their argument, but if it is not dismissed then it weakens the candidate's own argument.

Candidates should understand that evaluating ('making critical use of') the documents is not limited to assessing their credibility, which will often be difficult to do if a source has not been given. Other forms of evaluation, including those assessed in **Questions 2** and **3**, should also be used. Instances of correct evaluation in their answers to those questions may be used again in their answer to **Question 4**.

General comments

Most candidates appeared to have enough time to finish the paper, with a lot of evidence of time being used to plan answers to **Question 4**.

The standard of candidates varied greatly but there was evidence that some candidates had been well prepared.

Comments on specific questions

Question 1

All parts of **Question 1** rewarded the well-prepared candidate. Those who knew what was expected and attempted to analyse the argument usually gained between 3 and 5 of the 8 marks for analysis. Some candidates were unaware that quoting from the text is necessary for answering this question.

(a) Most candidates knew what was required and attempted to identify the conclusion. Around a quarter of the answers were correct. The most common incorrect answer was 'Overall homework has a negative effect on education'. A significant minority of candidates offered a paraphrase of the correct answer.

(b) Most candidates gained at least 1 mark here and many achieved both. Most candidates followed the instruction to give only two answers. Interestingly, some candidates who had given a paraphrased answer in **part (a)** went on to state precise and correct answers in **part (b)**.

(c) A higher proportion of candidates than in earlier sessions appeared to know what was expected in this question, although many did not.

Candidates needed to identify (by stating) parts of the paragraph as individual argument elements and, for full credit, to demonstrate relationships between any elements that had been identified. Some responses summarised the meaning of the paragraph, others evaluated it and some attempted to counter the reasoning.

Of those candidates who attempted analysis, some paraphrased the elements (rather than stating them word-for-word), some did not name the elements and some did not demonstrate relationships between them. Few candidates were able to distinguish between the reason and the example contained in the first sentence and many candidates thought the whole of the last sentence was the conclusion of the paragraph.

Question 2

The vast majority of candidates were aware of the nature of the task and attempted an evaluation for both parts of the question.

(a) As ever, responses that directly countered points given in the argument were not credited, nor were generic statements like 'there is no evidence to back this up' or 'we don't know the source' (although there were fewer of these this session). Most responses gained some credit on this question and those who did score tended to achieve at least 2 marks. The full range of available marks was seen. 2 marks were most commonly gained for identifying the rash generalisation in paragraph 3 and the slippery slope in paragraph 5. It was also relatively common to be awarded 2 marks for identification of the inconsistency in paragraph 4 and the false dichotomy in paragraph 5. All other points on the mark scheme were credited but explanations were rarely precise enough to achieve both of the available marks. Many candidates identified stated claims as assumptions and were not credited.

(b) Most candidates attempted to do what was required for this question and many gained some credit. It was relatively common for a candidate to score 2 marks for noticing that the IC of the paragraph might not be entirely consistent with the argument in the document as a whole, and linking this to a plausible judgement about the support given by the paragraph to the document as a whole. Some answers gained all 3 marks.

Question 3

Candidates appeared to know what type of answer was expected and most limited the length of their responses to match the number of marks available. Answers discussing the credibility of the sources of information are never credited in this question but, nevertheless, many candidate responses did just that. It is worth noting that a relatively high number of these candidates considered that the sources referenced in the text (a research journal and a leading US university) weakened the credibility of the statistics provided. However, in terms of reputation, expertise, ability to gather data and vested interest to publish correct and verifiable information, it is difficult to imagine any sources with higher credibility.

(a) Although the full range of available marks was seen, few candidates gained more than 2 marks. Credit was most often given for the first and fifth points on the mark scheme, but all the points were credited at least once.

(b) Candidates found this part of the question a little easier. Around half of candidates achieved at least 1 mark and many scored both.

Question 4

Candidates were required to use the documents to construct a reasoned case to support or challenge the conclusion that 'Schools should not set compulsory homework'. Unsurprisingly, most candidates were able to engage with this topic and attempted to construct their own arguments, although a few relied, at least partially, on sequentially summarising the documents. Some candidates were able to arrange their ideas into strands of reasoning that each supported a clear intermediate conclusion and, hence, scored well in the structure skill. However, only a minority of candidates were using the documents with a critical eye, which meant the marks for 'use of documents' were often restricted to level 1. Some of those responses that did attempt evaluation of the documents limited their critical comments to discussions of credibility. It is worth noting that other approaches to evaluation exist. For example, one could question the implied causal relationship between parental involvement and improved performance in Document 2, or the implication that there might also be a causal relationship between the success of Finland as a country and its alleged lack of homework.

Arguments supporting the conclusion were strengthened by effectively responding to objections about the potential effect on grades or work-related skills; those challenging the conclusion were strengthened if they effectively addressed the problem of a lack of utility, students becoming disaffected with learning, or missing out on personal development.

THINKING SKILLS

Paper 9694/42
Applied Reasoning

Key messages

In **Question 1**, candidates are expected to quote directly from the text in the document. It is acceptable to use ellipsis (...), so long as the start and end points are completely unambiguous.

In **Question 2**, candidates are expected to evaluate the reasoning in the document with reference to the flaws and weaknesses listed in the syllabus. Responses that simply dispute the reasons given in the argument, or generic statements such as 'there is no evidence to back this up' or 'we do not know the source', are unlikely to gain any credit.

In **Question 3**, candidates are expected to evaluate the validity of inferences that might be drawn from data in some form. Responses that simply question the source of the data or speculate about the sample size are unlikely to gain any credit.

In **Question 4**, candidates are expected to create their own argument structure, rather than follow the sequence of the documents. They should structure their arguments clearly, using indicator words such as 'because', 'so' and 'therefore' to identify intermediate conclusions, and make use of other argument elements to support their reasoning.

Candidates are asked to write an argument to support **or** challenge a claim, so they must aim to persuade the reader to agree with their chosen side. Giving a counter-position and dismissing it with reason may strengthen their argument, but if it is not dismissed then it weakens the candidate's own argument. Candidates should understand that evaluating ('making critical use of') the documents is not limited to assessing their credibility, which will often be difficult to do if a source has not been given. Other forms of evaluation, including those assessed in **Questions 2** and **3**, should also be used. Instances of correct evaluation in their answers to those questions may be used again in their answer to **Question 4**.

General comments

Most candidates appeared to have enough time to finish the paper with some evidence of time being used to plan answers to **Question 4**. A minority of candidates wrote disproportionately long answers for the earlier, lower-tariff questions.

The standard of candidates varied greatly but there was evidence that some candidates had been well prepared.

Comments on specific questions

Question 1

All parts of **Question 1** rewarded the well-prepared candidate. Those who knew what was expected and attempted to analyse the argument usually gained between 4 and 6 of the 8 marks for analysis. Some candidates were unaware that quoting from the text is necessary for answering this question.

(a) Most candidates knew what was required and attempted to identify the conclusion. Around a third of the answers were correct. A variety of incorrect suggestions for the main conclusion were seen and some candidates offered the whole of the last sentence, rather than just the part that was the conclusion. A minority of candidates offered a paraphrase of the correct answer.

(b) Most candidates gained at least 1 mark here and some achieved all 3. Most candidates followed the instruction to give only three answers. Interestingly, some candidates who had given a paraphrased answer in **part (a)** went on to state precise and correct answers in **part (b)**.

(c) The structure of this paragraph was unusual in that around half of it was a counterargument. Nonetheless, over a third of answers were credited and the full range of available marks was seen. A higher proportion of candidates than in earlier sessions appeared to know what was expected in this question, although some did not.

Candidates needed to identify (by stating) parts of the paragraph as individual argument elements and, for full credit, to demonstrate relationships between any elements that had been identified. Some responses summarised the meaning of the paragraph, others evaluated it and some attempted to counter the reasoning.

Of those candidates who attempted analysis, some paraphrased the elements (rather than stating them word-for-word), some did not name the elements and some did not demonstrate relationships between them. Some candidates identified the second sentence as 'a reasoning' (as opposed to 'a reason').

Question 2

The vast majority of candidates were aware of the nature of the task and attempted an evaluation for both parts of the question.

(a) As ever, responses that directly countered points given in the argument were not credited, nor were generic statements like 'there is no evidence to back this up' or 'we don't know the source' (although there were few of these this session). A little over half of responses gained credit on this question and those who did score tended to achieve at least 2 marks. The full range of available marks was seen. 2 marks were most commonly gained for identifying the slippery slopes in paragraphs 4 and 5 and, less often, for identifying the questionable assumption in paragraph 3. All other points on the mark scheme were credited but explanations were rarely precise enough to achieve both of the available marks. Many candidates identified stated claims as assumptions and were not credited.

(b) Most candidates attempted to do what was required for this question. Some answers gained 1 or 2 marks, more often from the first paragraph of the mark scheme, but occasionally from the second.

Question 3

Candidates appeared to know what type of answer was expected and most limited the length of their responses to match the number of marks available.

(a) This question differentiated well between candidates and the full range of available marks was seen. Credit was most often given for the first two points on the mark scheme, but all the points were credited at least once.

(b) Candidates found this part of the question more challenging, with less than a third of candidates achieving a mark. Many answers achieved 1 mark, usually for a version of the 1st or 6th, or occasionally the 7th, points on the mark scheme. Examiners regarded the 2nd point on the mark scheme as the most significant weakness, but few candidates included it in their answer. As ever, generic responses about the credibility of the sources were not credited.

Question 4

Candidates were required to use the documents to construct a reasoned case to support or challenge the conclusion that 'Governments should regulate the internet'. Most candidates were able to engage with this topic and attempted to construct their own arguments, although some relied, at least partially, on sequentially summarising the documents. Some candidates were able to arrange their ideas into strands of reasoning that each supported a clear intermediate conclusion and, hence, scored higher than level 1 for the structure skill. However, only a minority of candidates were using the documents with a critical eye, which meant the marks for 'use of documents' were often restricted to level 1. Some of those responses that did attempt evaluation of the documents limited their critical comments to discussions of credibility. It is worth noting that other approaches to evaluation exist. For example, one could question the objections to regulation raised by Document 1 on the basis that Document 1 relies heavily on the use of slippery slope reasoning, relying on the questionable assumption that actions are likely to lead to dire consequences, or why the analogy about the industrial revolution in Document 2 might be weak.

Arguments supporting the conclusion were strengthened by effectively responding objections about freedom of information or freedom of speech; those challenging the conclusion were strengthened if they effectively addressed the problem of potential harm associated with an unregulated internet.

THINKING SKILLS

Paper 9694/43
Applied Reasoning

Key messages

In **Question 1**, candidates are expected to quote directly from the text in the document. It is acceptable to use ellipsis (...), so long as the start and end points are completely unambiguous.

In **Question 2**, candidates are expected to evaluate the reasoning in the document with reference to the flaws and weaknesses listed in the syllabus. Responses that simply dispute the reasons given in the argument, or generic statements such as 'there is no evidence to back this up' or 'we do not know the source', are unlikely to gain any credit.

In **Question 3**, candidates are expected to evaluate the validity of inferences that might be drawn from data in some form. Responses that simply question the source of the data or speculate about the sample size are unlikely to gain any credit.

In **Question 4**, candidates are expected to create their own argument structure, rather than follow the sequence of the documents. They should structure their arguments clearly, using indicator words such as 'because', 'so' and 'therefore' to identify intermediate conclusions, and make use of other argument elements to support their reasoning.

Candidates are asked to write an argument to support **or** challenge a claim, so they must aim to persuade the reader to agree with their chosen side. Giving a counter-position and dismissing it with reason may strengthen their argument, but if it is not dismissed then it weakens the candidate's own argument. Candidates should understand that evaluating ('making critical use of') the documents is not limited to assessing their credibility, which will often be difficult to do if a source has not been given. Other forms of evaluation, including those assessed in **Questions 2** and **3**, should also be used. Instances of correct evaluation in their answers to those questions may be used again in their answer to **Question 4**.

General comments

Most candidates appeared to have enough time to finish the paper with some evidence of time being used to plan answers to **Question 4**. A minority of candidates wrote disproportionately long answers for the earlier, lower-tariff questions.

The standard of candidates varied greatly but there was evidence that some candidates had been well prepared.

Comments on specific questions

Question 1

All parts of **Question 1** rewarded the well-prepared candidate. Those who knew what was expected and attempted to analyse the argument usually gained between 4 and 6 of the 8 marks for analysis. Some candidates were unaware that quoting from the text is necessary for answering this question.

(a) Most candidates knew what was required and attempted to identify the conclusion. Around a third of the answers were correct. A variety of incorrect suggestions for the main conclusion were seen and some candidates offered the whole of the last sentence, rather than just the part that was the conclusion. A minority of candidates offered a paraphrase of the correct answer.

(b) Most candidates gained at least 1 mark here and some achieved all 3. Most candidates followed the instruction to give only three answers. Interestingly, some candidates who had given a paraphrased answer in **part (a)** went on to state precise and correct answers in **part (b)**.

(c) The structure of this paragraph was unusual in that around half of it was a counterargument. Nonetheless, over a third of answers were credited and the full range of available marks was seen. A higher proportion of candidates than in earlier sessions appeared to know what was expected in this question, although some did not.

Candidates needed to identify (by stating) parts of the paragraph as individual argument elements and, for full credit, to demonstrate relationships between any elements that had been identified. Some responses summarised the meaning of the paragraph, others evaluated it and some attempted to counter the reasoning.

Of those candidates who attempted analysis, some paraphrased the elements (rather than stating them word-for-word), some did not name the elements and some did not demonstrate relationships between them. Some candidates identified the second sentence as 'a reasoning' (as opposed to 'a reason').

Question 2

The vast majority of candidates were aware of the nature of the task and attempted an evaluation for both parts of the question.

(a) As ever, responses that directly countered points given in the argument were not credited, nor were generic statements like 'there is no evidence to back this up' or 'we don't know the source' (although there were few of these this session). A little over half of responses gained credit on this question and those who did score tended to achieve at least 2 marks. The full range of available marks was seen. 2 marks were most commonly gained for identifying the slippery slopes in paragraphs 4 and 5 and, less often, for identifying the questionable assumption in paragraph 3. All other points on the mark scheme were credited but explanations were rarely precise enough to achieve both of the available marks. Many candidates identified stated claims as assumptions and were not credited.

(b) Most candidates attempted to do what was required for this question. Some answers gained 1 or 2 marks, more often from the first paragraph of the mark scheme, but occasionally from the second.

Question 3

Candidates appeared to know what type of answer was expected and most limited the length of their responses to match the number of marks available.

(a) This question differentiated well between candidates and the full range of available marks was seen. Credit was most often given for the first two points on the mark scheme, but all the points were credited at least once.

(b) Candidates found this part of the question more challenging, with less than a third of candidates achieving a mark. Many answers achieved 1 mark, usually for a version of the 1st or 6th, or occasionally the 7th, points on the mark scheme. Examiners regarded the 2nd point on the mark scheme as the most significant weakness, but few candidates included it in their answer. As ever, generic responses about the credibility of the sources were not credited.

Question 4

Candidates were required to use the documents to construct a reasoned case to support or challenge the conclusion that 'Governments should regulate the internet'. Most candidates were able to engage with this topic and attempted to construct their own arguments, although some relied, at least partially, on sequentially summarising the documents. Some candidates were able to arrange their ideas into strands of reasoning that each supported a clear intermediate conclusion and, hence, scored higher than level 1 for the structure skill. However, only a minority of candidates were using the documents with a critical eye, which meant the marks for 'use of documents' were often restricted to level 1. Some of those responses that did attempt evaluation of the documents limited their critical comments to discussions of credibility. It is worth noting that other approaches to evaluation exist. For example, one could question the objections to regulation raised by Document 1 on the basis that Document 1 relies heavily on the use of slippery slope reasoning, relying on the questionable assumption that actions are likely to lead to dire consequences, or why the analogy about the industrial revolution in Document 2 might be weak.

Arguments supporting the conclusion were strengthened by effectively responding objections about freedom of information or freedom of speech; those challenging the conclusion were strengthened if they effectively addressed the problem of potential harm associated with an unregulated internet.