



# **3850 Certificate in Mathematics**

**Chief Examiner's Report**

**June 2018**

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The question paper is based on the learning outcomes and assessment criteria for 3850 as stated in the Qualification Handbook. Many of the questions are based on the sample contexts but questions may be based on any aspect of the assessment criteria. This report refers to the assessment criteria (AC) causing particular concern to candidates.

#### General comments

Candidates should read the question carefully and attempt all questions.

#### Stage 1

Candidates appeared relatively confident when working with whole numbers but had problems working with fractions, including decimal fractions and converting within a system. Some candidates found working within a context more difficult than a straightforward sum but the cohort showed an improvement on several of the points noted in the Chief Examiner's report for 2017.

Unit		Comment
101	Number	Candidates generally performed well in this section. However, around half of the candidates found it difficult to order amounts of money and only a quarter of the candidates were able to recognise decimal fractions and common fraction equivalences for halves and quarters.
102	Measurement and standard units	Many candidates were unable to estimate the capacity of a cup. Over half of the candidates were unable to read a thermometer in degrees Fahrenheit and were unaware of the freezing point. However, over half were able to select the correct answer for time expressed as a 24 hour clock time.
103	Pictograms, tables, graphs and charts	Candidates performed well on this section. However, only a third of candidates were able to select what was needed to finish the graph and only a third of candidates recognised that paying cash into a bank account would show as a credit. The majority of learners thought this was a direct debit.
104	Shape and space	Many candidates found this section challenging. Around half of the learners had problems with tessellation. Candidates often found the perimeter instead of the area of squares and rectangles. Just over a third were able to identify the net of a box with a lid. The most popular response was the net that folds to a box without a lid. Less than half of the candidates were able to find the volume of a cuboid shown as a 3D diagram and only a third gave the correct answer when only the top layer was shown. The majority of candidates confused

		<p>perimeter and volume and just added up the figures shown.</p> <p>Over two-thirds gave an incorrect answer to a question about lines of symmetry. They answered that the shape O did not have any lines of symmetry.</p>
105	Operations on whole numbers	<p>This section attracted a good percentage of correct answers. Over three-quarters of the candidates gave correct answers for addition and subtraction and over half of the candidates gave the correct answers for multiplication and division.</p>
106	Operations on decimal fractions	<p>Some candidates found this section challenging. Subtraction requiring a decimal to be taken from a whole number caused problems for over half of the candidates.</p> <p>Although two thirds of the candidates could multiply decimals in one question, less than half could multiply a decimal number by 100.</p> <p>The division problem set in context attracted correct answers from just under half of the candidates, but the division without context attracted correct answers from fewer than a quarter of the candidates. The most popular incorrect answer involved no carrying.</p>
107	Operations on common fractions	<p>Candidates performed better on this section than in previous years but some still found this section challenging. Just under a third could subtract fractions but three-quarters demonstrated an understanding of 'half' in the context of sharing a whole number.</p>
108	Appropriate strategies and mathematical terms	<p>Candidates found this section challenging. Just over a third of candidates could recognise the operation required to solve a problem. The most popular answer for finding a monthly rate of pay from the salary for a year was to multiply. Just under a half were able to recognise a suitable check and less than half did not show an understanding of mathematical terms in everyday conversation.</p>

## Stage 2

Candidates appeared relatively confident when working with whole numbers, percentages and decimals (apart from division) and there was an improvement in some aspects of candidates' understanding when working with fractions. 'Range and shape' and 'Space' caused the most problems together with 'Measurement and standard units'. There were still some problems with the interpretation of 'Tables, graphs, charts and maps' but generally, the cohort showed an improvement on several of the points noted in the Chief Examiner's report for 2017.

201	Place value	Candidates generally performed well in this section. However, only a third of candidates were able to recognise tenths.
202	Measurement and standard units	Candidates found it particularly difficult to convert, and work with, metric units of length and mass with only a third selecting the correct answer. However over three-quarters selected the correct answer for conversion of imperial units of capacity. Almost two-thirds obtained the correct answer when working with time.
203	Operations on whole numbers	Candidates generally performed well on this section. However, just over half were unable to select the correct answer for division by a two digit number.
204	Operations on decimal fractions	Candidates found this section more challenging than working with whole numbers. Two thirds could multiply a decimal number by a whole number but only just over a third of the candidates were able to select the correct answer for division. Less than half the candidates were able to multiply by 100, then divide by ten.
205	Operations on common fractions	Candidates found this section challenging. Half the candidates were able to calculate one quarter of a number. However, only a third of the candidates were able to add and subtract fractions.
206	Percentages	Some candidates found this section challenging. Calculating percentages caused more problems than expressing numerical information as a percentage.
207	Conversions between common fractions, decimal fractions and percentages	Most candidates found this section challenging. They had problems converting fractions to decimal fractions. Over a half thought $\frac{2}{5}$ written as a decimal fraction was 0.25.
208	Orders of magnitude	Candidates generally performed well on this section. Writing a number correct to two decimal places was

		the most difficult with just under half getting this correct.
209	Ratio and proportion	Some candidates found this section challenging. Three-quarters of the candidates chose the correct answer to the ratio problem but only a quarter of candidates chose the correct answer for the length of the wall on the plan.
210	Average and range	Most candidates found this section challenging. There appears to be confusion between mean and mode as over half the cohort chose the distractor giving the mode. Less than a quarter of candidates chose the correct answer for range. They chose the highest number of marks and the mode.
211	Elementary algebra	Most candidates performed well on this section.
212	Shape and space	Candidates found some parts of this section challenging. Around a half of the candidates were able to use the properties of angles on a straight line and recognised the properties of isosceles and equilateral triangles. They found the questions on area and perimeter difficult with less than a quarter of candidates choosing the correct responses.
213	Tables, graphs, charts and maps	Candidates generally performed well on this section. However, less than a half answered the question on intervals of a frequency table correctly.

### Stage 3

Candidates appeared relatively confident when working with integers, percentages and decimals but still experienced problems working with fractions. The section on 'Ratio and proportion' was more challenging at this level and range continued to cause problems. Candidates are more confident with the use of mode than average mean. Both 'Measurement and standard units' and some aspects of 'Shape and space' caused problems but candidates performed well on questions related to finding angles.

301	Operations on integers	Candidates generally performed well in this section. However, a third of the candidates were uncertain about prime numbers. About a quarter of candidates found it difficult to compare temperatures when one involved a negative number.
302	Operations on decimal fractions	Candidates generally performed well on this section. Some learners had problems using a combination of operations in context.
303	Operations on common fractions	Some candidates found this section challenging. Subtracting fractions was challenging for over half of the candidates when this involved borrowing from a whole number.
304	Order of operations	Candidates generally performed well on part of this section. Fewer than a quarter of the candidates had problems with the order of operations but over half had problems with the question involving a flowchart.
305	Percentages	Candidates performed well on this section. However, over half of the candidates found the question on depreciation challenging.
306	Conversions between common fractions, decimal fractions and percentages	This section was challenging for over half of the cohort.
307	Ratio and proportion	Candidates found this section challenging. Less than a third could work out the actual distance using the scale from a map and over a third thought a journey would take longer when a car travelled at a faster speed.
308	Measurement and standard units	Many candidates found this section challenging. Over a third had problems working with centilitres and litres. However, over three-quarters of the candidates were able to work out the time in

		Kingston when they were given the time in New York.
309	Reading and interpreting tables of figures, data and scales	Candidates found reading and interpreting the medal table easier than the table on cell phone usage. Only a third chose the correct time for the stopwatch but over 80% were able to project the number of sales on a graph.
310	Elementary statistics	Candidates found some questions in this section challenging. Some candidates appeared to be confused by the terms 'average mean' and range. Only a third of the candidates were able to answer the question on probability.
311	Elementary algebra	Most candidates answered this section well. The weakest area was using the formula.
312	Shape and space	Candidates found this section particularly challenging. Over two-thirds were able to find the missing angles but only a third could use Pythagoras' theorem to find a missing length. Just over a third were able to find the area of a circle but less than a third were able to find the volume of the shape. Candidates appeared to have little understanding of the idea of similarity and the effect of doubling the length on cubes with most thinking that this doubles the volume.

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