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GCSE

# Mathematics

8300/3F Paper 3 Foundation  
Report on the Examination

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8300  
November 2019

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## General

The majority of students found the paper accessible and attempted most of the questions. The work was generally well presented with working shown on most scripts. Arithmetic errors caused problems for some students who had otherwise engaged with a question and decided not to use a calculator. Some students either did not use or show the working from their calculator.

Topics that were well done included:

- Converting fractions to mixed numbers and decimals
- Money denominations problem
- Substitution into expressions
- Change of subject
- Time calculation
- Units conversion and calculation
- Proportion and money calculation
- Term-to-term sequences
- Calculation evaluation
- Distance-time graph
- Money calculation problem
- Probability.

Topics which students found difficult included:

- Integer problem
- Algebra simplification
- Coordinate problem
- Mean and mode from frequency table
- Perimeter algebra expression
- Probability problem with factors and multiples
- Volume of cuboid problem
- Evaluation of a calculation method
- Construction scale drawing
- Simultaneous equations
- Pie chart
- Rate of change evaluation from graph
- Cube root, reciprocal and ratio
- Trigonometry.

## Question 1

This question was well answered by the large majority. Chord was the most common incorrect answer.

## Question 2

This question was well answered by the majority.  $3 + c + d$  was the most popular incorrect answer.

**Question 3**

This question was well answered by the majority. 1 and 8 was the most common incorrect choice.

**Question 4**

This question was well answered by the large majority. 250 grams was the most popular incorrect choice.

**Question 5**

Part (a) of this question was reasonably well answered and part (b) of this question was well answered.

**Question 6**

This question was well answered. The most common errors were to miss out units or to use incorrect notation, in particular 5p being written as 0.5p. Some students made up coins, often 3p 25p and 30p, to make their total come to £16.55. A common incorrect answer was £10 £5 £1 50p and 5p.

**Question 7**

This question was well answered. The large majority of students used the given statements, although some answered with symbols. The last statement  $d$  is less than  $d^2$  when  $d = -1$  presented the most difficulty to students.

**Question 8**

This question was not well answered. Many students misinterpreted the question answering with multiples of four rather than numbers with a difference of four between their digits. Some students who correctly identified 26, 37 and 48 omitted 40 in their answer.

**Question 9**

Part (a) of this question was well answered by the majority. The most common incorrect answers were  $p = m + 2$  and  $p = \frac{m}{2}$

Part (b) of this question was not well answered. Common incorrect answers were 5,  $5x$ , 4,  $4x$  and  $x(5x - x)$

**Question 10**

This question was not well answered and there were a large number of non-attempts. (3, 5) alone was a common answer, with (1, 5) and (6, 5) a common incorrect answer. Many students did not attempt to identify the point *C* below the line *AB* whilst others did not identify their *P* on the line *AB* to allow any follow through from an incorrect *P*.

**Question 11**

Part (a) was well answered by the majority. The most common incorrect answer was  $\frac{6}{5}$  without a

fully correct method of  $60 \div \frac{6}{5}$

Part (b) was generally well answered.

**Question 12**

This question was very well answered. Some students did not correctly show units after correctly calculating 850. The most common errors used incorrect conversions for 1.5 litres to 15 000 ml or 150 ml without  $1.5 \times 1000$  followed by  $15\ 000 - 650$  or  $650 - 150$ .

**Question 13**

This question was well answered by the majority. The most common incorrect answers included  $0.64 + 0.29 = 0.93$  for 1.5 kg carrots or  $3.20 + 3.20 + 1.60 = 8.00$  for 5 kg potatoes or  $0.5\ \text{kg} = 29\text{p}$ ,  $1\ \text{kg} = 58\text{p}$  and  $1.5\ \text{kg} = \text{£}1.16$  or an answer using 1 kg potatoes =  $\text{£}1.5625$  from  $5 \div 3.20$

**Question 14**

Part (a) of this question was very well answered. Common incorrect answers were 40 from 36, 38, 40 and 8 from 20, 12, 8

Part (b) of this question was well answered by the majority. The most common error was to reverse the operations but not the order and multiply by 3 and then subtract 10 with an answer 170

**Question 15**

This question was very well answered. Calculation of the difference between days as  $\text{£}10$  was the most common correct reason. The most common incorrect answer involved totalling all days up to  $\text{£}170$ .

**Question 16**

This question was well answered by the large majority.  $x + 10$  is always negative was the most popular incorrect answer.

**Question 17**

Part (a) of this question was not very well answered. The most common incorrect answer was 4.

Part (b) of this question was not well answered by the large majority. The most common incorrect answers were  $30 \div 5 = 6$  and  $30 \div 10 = 3$ , often after students had correctly totalled the products of number of films and frequency to 51

**Question 18**

Part (a) of this question was very well answered by most students.

Part (b) of this question was also very well answered. Common incorrect answers included drawing a diagonal line from (09.00, 20) to (11.30, 0), drawing a horizontal line from (09.00, 20) to (11.30, 20) without indication at (10.00, 20) and there was also some misinterpretation of the scale with 11.30 indicated at three small squares after 11.00

**Question 19**

This question was not well answered and there were a large number of non-attempts. The most common incorrect answer was a misconception to expand double brackets with  $(x + 2)(x + 2) = x^2 + 2x + 2x + 4$ . There were also many incorrect simplifications including  $x + 2$  as  $2x$  or  $3x$  and also  $x + 2 + x + 2$  as  $4x$  or  $x^2 + 4$  or  $(x + 2)^2$ . Some students correctly indicated  $2x + 4 + 2x + 4 + 2 + 2$  or  $4x + 8 + 4$  without correctly fully collecting terms.

**Question 20**

This question was not very well answered.  $b = 7a$  was the most common incorrect choice.

**Question 21**

This question was not well answered and there were a large number of non-attempts. The most common errors involved spinners with one, two or four single digit factors of 100 or with more than one multiple of 25. Some spinners contained non-factors of 100, particularly 75

**Question 22**

This question was not well answered. Some students correctly identified 24, 48 or 96 but many did not progress further. Common incorrect answers involved calculations of surface area of cubes and cuboids.

**Question 23**

Part (a) of this question was well answered. Some students correctly identified 40.5 but did not use correct money notation, with others not continuing after calculating £13.50. Common incorrect

answers included calculations of £50, £56 and £54 without a 25% reduction or £54 with incorrect build up attempts of the reduction.

Part (b) of this question was not well answered by the large majority. Common incorrect reasons included “not calculated area, just length and width”, “must calculate area of walls and tiles”, “multiply not divide” or “need to multiply” without indicating  $15 \times 6$

#### Question 24

This question was not well answered and there were a large number of non-attempts. The majority of students correctly used the scale to draw an 8 cm line. Correct constructions commonly used intersecting arcs, the same radius as their base, although some students used lengths out of tolerance. The most common incorrect answer was to draw an equilateral triangle without any construction lines.

#### Question 25

Part (a) of this question was well answered by the majority. The most common incorrect answers were  $\frac{32}{83}$ ,  $\frac{2}{5} + \frac{3}{8} = \frac{31}{40}$  answer 31,  $\frac{2}{5} \times 83 = 33$  and  $\frac{3}{8} \times 83 = 31$

Part (b) of this question was well answered by the majority. Some students correctly followed through from an incorrect answer in part (a). The most common incorrect answer was  $\frac{9}{40}$  following  $\frac{31}{40}$  in part (a)

#### Question 26

This question was not well answered.  $\times 2$  and  $\times 8$  were the most common incorrect answers.

#### Question 27

This question was not well answered and there were a large number of non-attempts. Some students correctly eliminated  $y$  from the equations to show  $4x = 20$ ,  $x = 5$ ,  $2y = 1$  but then commonly incorrectly answered  $y = 2$ . The most common incorrect answers were  $x = 4$ ,  $y = 4$  or  $x = 4$ ,  $y = 2$ . There were many incorrect answers using trial and improvement.

#### Question 28

This question was not well answered by the very large majority. Most students identified  $260^\circ$  with others stating  $30^\circ = 450$ , but were unable to proceed correctly. The most common incorrect answer was 1800 with some answers of 3870 (from  $8.6 \times 450$ ) without correct working shown.

**Question 29**

This question was not very well answered. The most common error was to calculate a rate based on 40 hours with  $350 \div 40 = 8.75$ . Of those who calculated 70 and 40 to compare a 5 hour period, few then went onto calculate  $30 \div 5$  to work out the correct £6 difference. A misread of the graph was common.

**Question 30**

This question was not well answered by the very large majority and there were a large number of non-attempts. Common incorrect answers were an embedded answer of 8 as  $8^3 = 512$  or  $8 \times 8 \times 8 = 512$ ,  $\sqrt{512} = 22.6\dots$  and  $8 \div 0.4$ . Some divided both sides of the ratio by 0.4 and common misconceptions for the reciprocal of 0.4 were  $0.4^2 = 0.16$ , 0.6,  $\frac{1}{4}$ , 40

**Question 31**

This question was not well answered and there were a large number of non-attempts. Many students correctly identified the cosine ratio but did not proceed further. Common incorrect answers involved using sine to find the opposite side of 12.6 cm or using cosine but with incorrect calculator use e.g.  $\cos(39 \times 20) = 0.5$



### **Mark Ranges and Award of Grades**

Grade boundaries and cumulative percentage grades are available on the [Results Statistics](#) page of the AQA Website.