



## **General Certificate of Secondary Education**

# **Mathematics 4307**

## *Specification B*

**Module 3 Tier F 43053F**

# **Mark Scheme**

*2009 examination - November series*

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

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**The following abbreviations are used on the mark scheme:**

|              |   |
|--------------|---|
| <b>M</b>     | Method marks awarded for a correct method.  |
| <b>A</b>     | Accuracy marks awarded when following on from a correct method.<br>It is not necessary always to see the method. This can be implied. |
| <b>B</b>     | Marks awarded independent of method.  |
| <b>M dep</b> | A method mark which is dependent on a previous method mark being awarded.   |
| <b>ft</b>    | Follow through marks. Marks awarded for correct working following a mistake in an earlier step.                                       |
| <b>SC</b>    | Special Case. Marks awarded for a common misinterpretation which has some mathematical worth.   |
| <b>oe</b>    | Or equivalent.  |
| <b>eeoo</b>  | Each error or omission.   |

**MODULE 3 FOUNDATION TIER**

**43053F**

|      |                         |    |   |
|------|-------------------------|----|---|
| 1(a) | 9004                    | B1 | Accept gaps and commas                                |
| 1(b) | (zero) point three five | B1 | Thirty-five hundredths<br>B0 (zero) point thirty-five |
| 1(c) | 2.70(p)                 | B1 | Do <b>not</b> accept 2.7 or 270                       |

|      |    |    |  |
|------|----|----|--|
| 2(a) | 12 | B1 |  |
| 2(b) | 5  | B1 |  |
| 2(c) | 25 | B1 |  |
| 2(d) | 15 | B1 |  |
| 2(e) | 25 | B1 |  |

|      |                           |        |                            |
|------|---------------------------|--------|----------------------------|
| 3(a) | $30 + 25 + 40$            | M1     | oe Allow one omission      |
|      | 95                        | A1     |                            |
| 3(b) | $200 - 90 (= 110)$        | M1     | $90 + 2 \times 30 (= 150)$ |
|      | their $110 - 2 \times 30$ | M1 dep | 200 - their 150            |
|      | 50                        | A1     | SC1 Answer only 0.5 p      |
|      | <b>Alternative method</b> |        |                            |
|      | $200 - 2 \times 30$       | M1     |                            |
|      | their $140 - 90$          | M1 dep |                            |
|      | 50                        | A1     |                            |

|      |                            |        |  |
|------|----------------------------|--------|--|
| 4(a) | $\frac{4}{5} \times 240$   | M1     | oe eg $48 \times 4$  |
|      | 192                        | A1     |  |
| 4(b) | $240 \times 3 \times 12$   | B2     | B1 any pair of the 3 multiplied<br>B1 720 or 36 or 2880 seen |
| 4(c) | $240 \times 0.1 (= 24)$    | M1     | oe   |
|      | 240 + their 24 (= 264)     | M1 dep |  |
|      | $10\ 000 \div$ their 264   | M1     | 37.8787... Accept 37.8 to 37.9                               |
|      | their $37.8787... \div 12$ | M1 dep | 3.15656... Accept 3.15 to 3.16                               |
|      | (£)3.15 or (£)3.16         | A1     | SC3 3.47 SC2 3.472(...)                                      |

|      |                               |    |   |
|------|-------------------------------|----|---|
| 5(a) | $5 \times 5 \times 5 (= 125)$ | B1 | oe  |
| 5(b) | 216                           | B1 |   |
| 5(c) | No with valid explanation     | B1 | eg there is no whole number that can be cubed to make 196 |
| 5(d) | Either 1 or 64                | B1 | 1 000 000 etc Condone 0                                   |

|                       |  |        |                                       |
|-----------------------|--|--------|---------------------------------------|
| 6                     | Any valid attempt to find new volume, cost or ratio for one size | M1     |                                       |
|                       | Any valid attempt to compare all 3 sizes                         | M1     |                                       |
|                       | All 3 answers correct  | A1     |                                       |
|                       | Medium   | B1 ft  | ft if M2 awarded and consistent units |
|                       | <b>One possible method</b>                                       |        |                                       |
|                       | Attempts to divide medium cost by 3 <b>or</b> large cost by 5    | M1     |                                       |
|                       | 1.99 or $199 \div 3$ <b>and</b><br>3.49 or $349 \div 5$          | M1 dep |                                       |
|                       | (0.)66... and (0.)69(8)<br>or (0.)7(0)                           | A1     |                                       |
| Medium bottle is best | B1 ft  |        |                                       |

|      |        |    |  |
|------|--------|----|--|
| 7(a) | £32.50 | B1 |  |
| 7(b) | £37.49 | B1 |  |

|   |  |        |  |
|---|--|--------|--|
| 8 | $0.4 \times 800 (= 320)$   | B1     | oe   |
|   | $0.8 \times \text{their } 320 (= 256)$   | B1     | their 320 must be $< 800$  |
|   | $0.32 \times 800 = 256$ or<br>$\frac{544}{800} \times 100 = 68$ or<br>$\frac{256}{800} \times 100 = 32, 100 - 32 = 68$ | B1     | oe - ie a sum that gives 68% as the answer<br>or now finds 68% off original and finds this also to be £256 |
|   | <b>Alternative method</b>  |        |  |
|   | $0.4 \times 0.8 (= 0.32)$  | M1     |  |
|   | $1 - \text{their } 0.32 (= 0.68)$  | M1 dep |  |
|   | $0.68 = 68\%$  | A1     |  |

|      |                   |       |   |
|------|-------------------|-------|---|
| 9(a) | 682               | B1    |   |
| 9(b) | 337               | B1    |   |
| 9(c) | 23                | B1    |   |
| 9(d) | 108               | B1    |   |
| 9(e) | $10\,000 \div 50$ | M1    | oe eg $100 \times 2$ or $100 \div 0.5(0)$ |
|      | 200               | A1    |   |
| 9(f) | 200               | B1 ft | Correct answer or their (e)               |
| 9(g) | 34.6(0...)        | B1    |   |

|       |               |    |   |
|-------|---------------|----|---|
| 10(a) | $\frac{1}{4}$ | B2 | B1 equivalent fraction eg $\frac{6}{24}$<br>B1 wrong answer but correctly cancelled down to simplest form<br>SC1 0.25 with $\frac{1}{4}$ not seen |
| 10(b) | 6             | B1 |   |

|    |                             |       |                                 |
|----|-----------------------------|-------|---------------------------------|
| 11 | $365 - 2$ or 363            | B1    |                                 |
|    | their $363 \div 3 \times 2$ | M1    | $\frac{250}{\text{their } 363}$ |
|    | 242 and No                  | A1 ft | No and 375 or 242 seen          |

|       |                    |       |                             |
|-------|--------------------|-------|-----------------------------|
| 12(a) | $0.02 \times 4000$ | M1    | oe eg build-up              |
|       | 80                 | A1    | SC1 3920                    |
| 12(b) | 80                 | B1 ft | Correct answer or their (a) |

|       |                  |    |                       |
|-------|------------------|----|-----------------------|
| 13(a) | -8 circled       | B1 | Accept any indication |
| 13(b) | 0.000 28 circled | B1 | Accept any indication |
| 13(c) | 600 circled      | B1 | Accept any indication |

|    |                                 |        |                                  |
|----|---------------------------------|--------|----------------------------------|
| 14 | $10 \times 48 (= 480)$          | M1     | $10 \times 48 (= 480)$           |
|    | their $480 - 76 (= 404)$        | M1 dep | $500 - \text{their } 480 (= 20)$ |
|    | $500 - \text{their } 404$       | M1 dep | dep on M2 their $20 + 76$        |
|    | 96                              | A1     | 96                               |
|    | <b>Alternative method</b>       |        |                                  |
|    | $10 \times 48 (= 480)$          | M1     |                                  |
|    | $500 + 76 (= 576)$              | M1     |                                  |
|    | their $576 - \text{their } 480$ | M1 dep | dep on M2                        |
|    | 96                              | A1     |                                  |

|       |   |    |   |
|-------|---|----|---|
| 15(a) | $\frac{8(+)}{9(-)} \frac{7}{4}$ or $\frac{15}{5}$ | M1 |   |
|       | 3   | A1 | SC1 error seen but answer 3   |
| 15(b) | $\frac{420}{600} \times 100$                      | M1 | oe eg $420 \div 6$ or full build-up   |
|       | 70  | A1 | SC1 answer $\frac{70}{100}$<br>or answer 30   |
| 15(c) | $\frac{16}{18} (-) \frac{3}{18}$                  | M1 | oe At least one numerator correct with an appropriate common denominator. Ignore decimals |
|       | $\frac{13}{18}$                                   | A1 | oe fraction Ignore further working  |

|    |   |       |   |
|----|---|-------|---|
| 16 | One correct breakdown including a prime factor  | M1    | $2 (\times) 40$ or $5 (\times) 16$<br>or $2 (\times) 4 (\times) 10$<br>or $2 (\times) 2 (\times) 20$<br>or $8 (\times) 2 (\times) 5$<br>or $2 (\times) 2 (\times) 2 (\times) 10$<br>or $2 (\times) 2 (\times) 4 (\times) 5$ |
|    | $2 (\times) 2 (\times) 2 (\times) 2 (\times) 5$ | A1    | Allow trees or repeated division for M1A1, condone $\times 1$   |
|    | $2^4 \times 5$                                  | A1 ft | ft a string of multiplying primes correctly converted to index form after M1 awarded<br>Only dots or $\times$ for final mark  |

|    |  |    |  |
|----|--|----|--|
| 17 | $200 \div 5 \times 2$ or $200 \div 5 \times 3$ | M1 |  |
|    | 80 and 120                                     | A1 |  |