**General Certificate of Secondary Education**
**January 2013**

**Mathematics (Linear) B** **4365**
**Paper 2**
**Foundation Tier**

# Final

***Mark Scheme***

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.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this Mark Scheme are available to download from the AQA Website: www.aqa.org.uk

Copyright © 2013 AQA and its licensors. All rights reserved.

COPYRIGHT
AQA retains the copyright on all its publications. However, registered centres for AQA are permitted to copy material from this booklet for their own internal use, with the following important exception: AQA cannot give permission to centres to photocopy any material that is acknowledged to a third party even for internal use within the centre.

Set and published by the Assessment and Qualifications Alliance.

The Assessment and Qualifications Alliance (AQA) is a company limited by guarantee registered in England and Wales (company number 3644723) and a registered charity (registered charity number 1073334). Registered address: AQA, Devas Street, Manchester M15 6EX

## Glossary for Mark Schemes

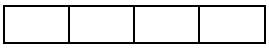
GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

| | |
|---|---|
| **M** | Method marks are awarded for a correct method which could lead to a correct answer. |
| **M dep** | A method mark dependent on a previous method mark being awarded. |
| **A** | Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied. |
| **B** | Marks awarded independent of method. |
| **B dep** | A mark that can only be awarded if a previous independent mark has been awarded. |
| **Q** | Marks awarded for quality of written communication. |
| **ft** | Follow through marks. Marks awarded for correct working following a mistake in an earlier step. |
| **SC** | Special case. Marks awarded for a common misinterpretation which has some mathematical worth. |
| **oe** | Or equivalent. Accept answers that are equivalent.<br>eg accept 0.5 as well as $\frac{1}{2}$ |
| **[*a*, *b*]** | Accept values between *a* and *b* inclusive. |
| **[*a*, *b*]** | Accept values between *a* and *b* inclusive. |
| **25.3 …** | Allow answers which begin 25.3 e.g. 25.3, 25.31, 25.378. |
| **Use of brackets** | It is not necessary to see the bracketed work to award the marks. |

# Paper 2 Foundation Tier

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **1(a)** | 4019 | B1 | |
| **1(b)** | 700<br>or (7) hundred(s) | B1 | Do not accept hundredths |
| **2(a)** | (Car) C or 12 590 | B1 | |
| **2(b)** | 13 400 or 17 900 or 12 600 | M1 | 20 or 40 or 10 |
| | 13 400 and 17 900 and 12 600 | M1dep | 20 and 40 and 10 |
| | 17 860 or 17 900<br>or Car B | A1 | 40 |
| **3(a)** | Hexagon → 6 sides | B1 | |
| | Quadrilateral → 4 sides | B1 | |
| | Pentagon → 5 sides | B1 | |
| **3(b)** | C or (square based) pyramid | B1 | |
| **4** | Centimetres | B1 | |
| | Litres | B1 | |
| | Grams | B1 | |
| **5(a)** | 24 259 + 805 | M1 | |
| | 25 064 | A1 | SC1 for 23 454 or 26 674 or 27 479 |
| **5(b)** | 805 × 8<br>or 805 × 0.08 | M1 | 6440 (p)<br>64.4 |
| | £64.40 | Q1 | Strand (i) correct notation |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **6** | IIII and ~~IIII~~ I | B1 | |
| | 9 and 12 | B1 | |
| | 31 | B1ft | ft from their frequencies |
| **7** | 1 2 2 2 3 | B2 | Any order<br><br>B1 for two conditions met<br><br>eg 1 1 2 2 3<br>1 1 2 2 2<br>1 2 2 3 ...<br>1 2 2 3 4 |
| **8(a)** | 500 | B1 | |
| **8(b)** | 1200 (grams) seen or implied<br>or values with a total of 1.2 | M1 | Values must not exceed 0.8 |
| | Values with a total of 1200 | A1 | Values must not exceed 800<br>eg 300 × 4 or 800 and 400 |
| **9** | 1500 ÷ 11<br>or 15 ÷ 0.11 | M1 | 11 × 136 or 14.96<br>or 11 × 137 or 15.07<br><br>Condone 15 ÷ 11 or 1500 ÷ 0.11 |
| | 136.3(...) or 136.4 | A1 | 11 × 136 = 14.96<br>or 11 × 137 = 15.07 |
| | 136 | Q1ft | Strand (i) for rounding down correctly having used consistent units<br>SC2 for 137 |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **10(a)** | 10 | B1 | |
| **10(b)** | Correct pattern drawn | B1 |  |
| **10(c)** | +3 seen or implied<br><br>or 10 + 3 + 3 + 3<br>or 6 × 3 + 1<br>or 13 + 7 – 1 | M1 | eg (4, 7, 10) 13 or 16 |
| | 19 | A1 | |
| **11** | 2 × 5 + 1 or 11<br>or 3 × 5 – 2 or 13<br>or 5 + 7 or 12 | M1 | oe |
| | (2 × 5 + 1 =) 11<br>and (3 × 5 – 2 =) 13<br>and (5 + 7 =) 12 | A1 | |
| | 13 | A1ft | ft their largest value |
| **12** | 8 × 6.5 or 52<br>or 8 ÷ 2 or 4<br>or 6.5 ÷ 2 or 3.25 | M1 | 780 ÷ 6.5 or 120<br>780 ÷ 8 or 97.5<br>or 780 × 2 or 1560 |
| | their 52 ÷ 2<br>or their 4 × 6.5<br>or their 3.25 × 8<br><br>or 780 ÷ their 52<br>or 780 ÷ 4<br>or 780 ÷ 3.25 | M1dep | their 120 ÷ 8<br>or their 120 × 2<br><br>or their 97.5 ÷ 6.5<br>or their 97.5 × 2<br><br>or their 1560 ÷ 8<br>or their 1560 ÷ 6.5 |
| | 26 or 15 or 195 or 240 or 182 | A1 | |
| | 780 ÷ their 26<br>or their 15 × 2<br>or their 195 ÷ 6.5<br>or their 240 ÷ 8 | M1 | |
| | 30 | A1 | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **13** | (red, 1)<br>red, 2<br>red, 3<br>blue, 1<br>blue, 2<br>blue, 3 | B2 | B1 for 4 correct<br>B1 for 5 correct and 1 incorrect<br><br>B0 for 5 correct and 2 incorrect<br>B0 for 4 correct and 1 incorrect<br><br>Ignore repeats (which may be reversed) |
| **14(a)** | Zoo | B1 | Accept Z |
| **14(b)** | Hospital | B1 | Accept H |
| **14(c)** | [063, 067] | B2 | B1 for [63, 67] or 062 or 068<br>SC1 for [243, 247] |
| **15(a)** | $\frac{2}{5}$ | B2 | B1 for $\frac{8}{20}$ or $\frac{4}{10}$ or 2 out of 5 or 40% or 0.4<br>SC1 for $\frac{3}{5}$ |
| **15(b)** | 1 – 0.14 | M1 | oe |
| | 0.86 | A1 | oe |
| **16** | $\frac{3}{4}$ × 180<br>or $\frac{1}{4}$ × 180 (× 3) (= 45 (× 3)) | M1 | oe |
| | 135 | A1 | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **17(a)** | 5 × 2<br>or 500 ÷ 50<br>or 10<br><br>or 3 × 2<br>or 300 ÷ 50<br>or 6 | M1 | 4 tiles per square metre<br><br>or 5 × 3 or 15<br><br>or 500 × 300 or 150 000<br><br>or 0.5 × 0.5 or 0.25<br><br>or 50 × 50 or 2500 |
| | their 10 × their 6 | M1dep | oe<br>5 × 3 × 4<br>their 15 ÷ $\frac{1}{4}$<br><br>or their 15 ÷ their 0.25<br><br>or their 150 000 ÷ their 2500 |
| | 60 | A1 | |
| **17(b)** | 46 × 5 + 25 | M1 | |
| | 255 | A1 | |
| | No | Q1ft | oe<br>strand (ii) for correct use of BIDMAS and decision to match their answer. Must score M1 to award Q mark. |
| **Alt 17(b)** | (250 – 25) ÷ 5 | M1 | oe<br>Condone missing brackets |
| | 45 | A1 | |
| | No | Q1ft | oe<br>strand (ii) for correct use of BIDMAS from (250 – 25) ÷ 5 and decision to match their answer. Must score M1 to award Q mark. |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **18** | Bar showing 19 for GB | B1 | |
| | 16 + 10 + 15 + 9 + 6 + 10 (= 66)<br><br>or 16 + 10 + 15 + 9 + 6 + 10 + 19 (= 85) | M1 | Allow one error |
| | 113 – their 66 – 19<br><br>or 113 – their 85 | M1dep | |
| | 28 | A1 | 13 and 15 seen |
| | 13 and 15 bars drawn correctly | B1ft | ft from two whole numbers that add up to their 28 and two more bronze than silver |
| **19** | 8.3 × 3.6 or 29.88 or 29.9 or 30 | M1 | |
| | their 29.88 ÷ 8 \| 8 × 4 or 32 | M1 | |
| | [3.735, 3.75] \| 29.88 and 32 | A1 | |
| | Need 4 tins | B1ft | Rounding up their number of tins |
| | (£)23.96 | A1ft | ft from their 4 × 5.99 if the first two M1 marks have been awarded<br><br>If perimeter used can score M0M1A0B1ftA0 |
| **20(a)** | $6x = 28 + 5$ | M1 | oe<br>$\frac{28 + 5}{6}$ |
| | 5.5 | A1 | oe |
| **20(b)** | $2a + 7b$ | B2 | B1 for one correct term<br>Do not ignore further work |
| **21(a)** | 343 | B1 | |
| **21(b)** | Any two cube numbers from 8 or 27 or 64 or 125 or 216 | M1 | |
| | 125 and 216 | A1 | Any order<br>Accept $5^3$ and $6^3$<br>Accept 5 and 6 |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **22(a)** | 108 | B1 | |
| | Corresponding | Q1 | strand (i)<br>Mark is dependent on scoring B1 |
| **22(b)** | 180 – 117 | M1 | oe |
| | 63 | A1 | |
| **23(a)** | $(C =)$ $15x + 20y$<br>or $(C =)$ $5(3x + 4y)$ | B2 | Accept $0.15x + 0.2y$<br><br>B1 for one correct term<br>Do not ignore further work<br>Do not accept $x15 + y20$ |
| **23(b)** | 150 × 15 or 90 × 20<br><br>or 150 × 0.15 or 90 ×0. 20 | M1 | 150 ÷ 5 or 90 ÷ 5<br><br>or 15 ÷ 5 or 20 ÷ 5 |
| | 150 × 15 and 90 × 20<br><br>or 150 × 0.15 and 90 ×0. 20<br><br>or 2250 and 1800<br>or 4050<br><br>or 22.5 and 18<br>or 40.5 | M1dep | 150 ÷ 5 and 90 ÷ 5<br><br>or 15 ÷ 5 and 20 ÷ 5<br><br><br>or 30 and 18<br><br>or 3 and 4 |
| | 4050 ÷ 5<br>or 810<br><br>or 40.50 ÷ 5<br>or 8.10 | M1dep | 30 × 15 and 18 × 20<br>or 450 and 360<br>or 810<br><br>or 120 and 72<br><br>150 × 3 and 90 × 4<br>or 450 and 360<br>or 810<br><br>or 12 and 16 |
| | 4050 – 810<br><br>or 40.50 – 8.10<br><br>or 4050 ÷ 5 × 4<br><br>or 40.50 ÷ 5 × 4 | M1dep | <br><br>150 × 12 + 90 × 16<br>or 1800 + 1440<br>or 3240 |
| | 32.40 | A1 | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **24** | 360 ÷ 4 or 90 seen | M1 | Right angle symbol may be on diagram<br>May be implied from symmetry line and 45 |
| | 360 – 90 – 36 (= 234) | M1dep | If symmetry used<br>90 ÷ 2 or 45 and 36 ÷ 2 or 18 seen<br>or 63 seen<br><br>If isosceles triangles used<br>(180 – 90) ÷ 2 or 45 and (180 – 36) ÷ 2 or 72 seen |
| | their 234 ÷ 2<br>or 180 – 45 – 18<br>or 45 + 72 | M1dep | Dependent on 1st two Method marks |
| | 117 | A1 | |
| **Alt24** | 360 × 4 – 360<br>or 6 × 180<br>or 1080 | M1 | oe |
| | their 1080 – 36 × 4 (= 936) | M1dep | |
| | their 936 ÷ 8 | M1dep | |
| | 117 | A1 | |
| **25(a)** | 2 squares to the right **and** 3 up | B2 | B1 for 2 squares to the right **or** 3 up |
| **25(b)** | Rotation | B1 | |
| | 90 clockwise or –90 | B1 | oe<br>Accept $\frac{1}{4}$ of a turn clockwise |
| | (4, 3) | B1 | |
| **26** | $x + x + 3 + x + x + 3$ (=37) | M1 | oe<br>$(2x + 3) \times 2$ condone missing brackets<br>37 – 6 |
| | $4x + 6 = 37$<br>or $4x = 37 – 6$ | M1dep | oe<br>$\frac{37-6}{4}$ |
| | ($x$ =) 7.75 | A1 | oe |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **27(a)** | Midpoints seen or implied<br>5, 15, 25, 35, 45 | B1 | |
| | their $\Sigma fx$<br><br>5 × 5 + 15 × 22 + 25 × 28 + 35 × 21 + 45 × 4<br>or 25 + 330 + 700 + 735 + 180<br>or 1970 | M1 | This mark is for the sum of their midpoints × frequencies but condone one error<br><br>5 × 5 = 25<br>15 × 22 = 330<br>25 × 28 = 700<br>35 × 21 = 735<br>45 × 4 = 180 |
| | their $\Sigma fx \div 80$ | M1dep | their 1970 ÷ 80 |
| | 24.6(...) | A1 | Accept 25 with working shown |
| **27(b)** | 5 + 22 + 28 or 55 | M1 | 21 + 4 or 25 |
| | $\frac{5+22+28}{80} \times 100$ | M1 | $\frac{21+4}{80} \times 100$ |
| | 68(...)(%) or 69 and No | A1 | 31.(...)(%) and no |
| **Alt 27(b)** | 5 + 22 + 28 or 55 | M1 | 21 + 4 or 25 |
| | $\frac{70}{100} \times 80$ or 56 | M1 | $\frac{30}{100} \times 80$ or 24 |
| | 55 and 56 and No<br>or 56 is in the 30 – 40 group so No | A1 | 24 and 25 and No |