IGCSE

MARK SCHEME for the October/November 2014

0580 MATHEMATICS

0580/43 Paper 4 (Extended), maximum raw mark 130

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Abbreviations

cao correct answer only dep dependent

FT follow through after error isw ignore subsequent working oe or equivalent

SC Special Case

nfww not from wrong working soi seen or implied

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| Qu. | Answers | Mark | Part Marks |
| 1 (a) (i) (ii)(iii) (b) | 5.37[1...]54.1 or 54.11 to 54.1265.8263.2 or 263 | 2323FT | 2 2 2M1 for [AD = ] 2.6 + 4.7 oe or better4.7M2 for tan [BCD =] (17 − 11 − 2.6) oeorB1 for 3.4 seen11 + 17M1 for 2 × 4.7 oeFT their (a)(iii) × 4 correctly evaluated 9.4 2M2 for their (a)(iii) ×  4.7  oe or 9.4 2  4.7 2M1 for [scale factor =]  4.7  or  9.4  soi    |
| 2 (a) (i)(ii) (b) | 9208 *×* 7 [=805] oe30.8 or 30.76 to 30.771211 final answer | 125 | 2990 *×* 7 [= 805]268M1 for (11 + 8 + 7) [× 100]B4 for 13 926.5[0] [area A total sales]orB3 for 11 040 [area B] and 10 867.50 [area C] or21 907.5 [area B + area C]orB2 for 11 040 [area B] or 10 867.50 [area C]orM1 for 736 [B tickets] and M1 for 483 [C tickets]After 0 scoredSC2 for answer of 1196 orSC1 for 13754 (A total sales) |

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| (c) | 37 720 | 3 | 35834M2 for 0.95 oeorM1 for 35834 associated with 95[%] |
| 3 (a) (i) (ii)(iii) (b) (i)(ii) | 52Angles in same segment104Angle at centre is twice angle atcircumference34Angle between tangent and radius= 90°7.65 to 7.65149.3 or 49.33 to 49.34… | 11dep111143 | Accept same arc, same side of same chordAccept double, 2 × but not middle, edgeAccept right angle, perpendicularM2 for 8.92 + 72 – 2 × 8.9 × 7 × cos56 orM1 for correct implicit formula andA1 for 58.5 to 58.6M2 for [sinBEC =] 7 sin 56 oetheir (b)(i)orM1 for sin 56 *=* sin BEC oetheir (b)(i) 7 |
| 4 (a) (i)(ii) (iii)(b) (i)(ii) | Ariven with comparable form for both shown or difference between the two fractions shown615 oe715 oeCompletes tree diagram correctly126  9 350 oe  25   | 12332 | Accept probabilities changed to decimals or percentages (to 2sf or better)3 2M1 for 5 *×* 33 1 2 2 2 1M2 for 5 × 3 + 5 × 3 oe 1 − their (a)(ii) − 5 × 3or3 1 2 2M1 for 5 *×* 3 or 5 *×* 3 seenB2 for 5 values correct orB1 for 1 value correct3 6 7M1 for 5 × 7 × 10 |

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| (iii) |  344 350 oe | 3 | M2 for 1− their 2 × their 1 × their 3 oe5 7 10or 3 + 2 × 6 + 2 × 1 × 7 5 5 7 5 7 102 1 3M1 for their 5 × their 7 × their 10 oeor identifies the 7 routesor attempt to add 7 probabilities with at least 5 correct 9 + 27 + 3 + 9 + 6 + 18 + 1 oe25 175 50 350 25 175 25 |
| 5 (a) (i) (ii) (iii) (iv)(b) |  0 − 4   4 0  − 1 1   1 − 1 − 1 0   0 − 1 − 13  5  1 2   0 1  | 11223 | B1 for three correct elementsB1 for either correct in this formM1 for understanding to find the inverse of Q 1 2 and M1 for det = 1 or for k   k*≠*0 0 1 Alternative 1 − 2  a b   1 0    =   0 1  c d   0 1 Leading to a – 2c = 1 and c = 0 then a = 1 and b – 2d = 1 and d = 1 then b = 2M2 all four equations, M1 for a pair of correct equations |
| 6 (a) (i)(ii) (iii) | *x8**3* final answer7 315x y final answer816x final answer | 122 | M1 for 2 elements correct*k* 8M1 for 16x or kx |

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*r*  *π* − 1

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| (b)(c) |  [− ]7  2 − 4.3 −12 or better andp = [– –]7 and r = 2(3) oe3.48, –1.15 caox *+ 5* 1 5x *2* or x *+* x *2* final answernfww | B1B1B1B13 |  7 *2*or for  *x* − 6  p + q p − q Must see or or bothr r7  7 *2*or for 6 ± 4 +  6  After B0,SC1 for answer 3.5 and –1.1or 3.482… and –1.149 to –1.148 seen or for 3.48, –1.15 seenor for answer –3.48 and 1.15B1 for (x + 5)(x – 5)and2B1 for x (x – 5) |
| 7 (a)(b) (i)(ii)(c) (i)(ii) | 12 × 8 × 8 × sin 56 oe26.52 to 26.5372.[0] or 71.87 to 72.021.1 or 21.2 or 21.14 to 21.1730 2 1 2360 × *π* × r − 2 × r × sin 30 oe 1 × *π* × r 2 − 1 × r 212 41 *2*  1 4  3 20.6 or 20.7 or 20.55 to 20.71 | M1A133M2A1A13 | or [½ × 2] 8sin28 × 8cos28 or [½ × 2] × 7.06… ×3.75…M2 for 26.5/( *π ×* 6.5*2* ) × 360 oex *2*or M1 for 360 × π × 6.5 = 26.5 or betterM2 for their (b)(i) × π × 2 × 6.5 + 2 × 6.5 oe360or M1 for their (b)(i) × π × 2 × 6.5 oe or their (a)360 0.5 *×* 6.530 2 1 2M1 for 360 × *π* × r or 2 × r × sin 30Dep on M2 A1 and no errors seen2 5M2 for [r =] 1 (1 *π −* 1)4 3or M1 for one correct rearrangement step to r1 *2*  1 from 4 *r*  3 *π* − 1 = 5  |

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| 8 (a) (i) (ii)(b) (i) (ii)(iii) (c)(d) (i)(ii) | (1, 2)y = 3x – 1 cao final answer(x + 5)(x – 2) isw solutions[a =] –5 [b =] 2[c =] –10x = –1.5Inverted parabolax-axis intercepts at –2 and 9y-axis intercept at 18p = 6q = 43–43 | 1+1323FT1FT B1B2B131FT | 8 − −4M1 for gradient = 3 − −1 oeand M1 for substituting (3, 8) or (–1, –4) into their y = 3x + c or for finding y-intercept is –1SC1 for (x + a)(x + b) where ab = –10 or a + b = 3B1FT for each of their 5 and their –2 from (b)(i)and B1 for c = –10FT x = (their (a + b))/2B1 for eachAfter B0 allow SC1 for (9 – x)(2 + x) oe2B2 for (x + 6) – 43 or p = 6 or q = 432 2 2or M1 for (x + 6) or x + px + px + pand2 2M1 for –7 – (their 6) or p – q = –7 or 2p = 12FT – their q |
| 9 (a) (i)(ii) (b) (i)(ii) (iii) | 71764401.6[0] | 41FT222FT | 16 × 11 + 17 × 10 + 18 p + 19 × 4 + 20 × 8 M2 for 11 + 10 + 4 + 8 + = 17.7por better orM1 for sum of two correct products or better or for [total =] 11 + 10 + 4 + 8 + pandB1 for 582 + 18p = 17.7 (33 + p)STRICT FT median for their p if integer320M1 for 6.4 × 1.28 oe320M1 for 480 × 60 oeFT their (b)(i) / their (b)(ii) evaluated correctly to 2dp480M1 for their (b)(i) / their (b)(ii) or 6.4 × 1.28 ÷ 60 |

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| (c) | 9.9125 cao | 5 | B4 for answer 9912.5 orM1 for 25 to 35 × 290 to 310 oeand B1 for 32.5 used and B1 for 305 or 5 mins 5 secs usedand M1 indep for any correct conversion seen m to km |
| 10 (a) (i) (ii)(b) | 5x + 14 final answer14.28a – 3b + 14 = 32.5 or better5a + 4b + 13.5 = 39.75 or betterEquates coefficients of either a or b40a – 15b = 92.540a + 32b = 210 or32a – 12b = 7415a + 12b = 78.75Adds or subtracts to eliminate47b = 117.547a = 152.75[a =] 3.25 [b =] 2.5 | 23B1B1M1M1A1A1 | M1 for 5x + k or kx + 14M1 for 5x = 32 – 14 FT their expression in (a)(i) A1FT for x = 3.68a – 3b = 18.55a + 4b = 26.25or rearranges one of their equations to make a or b the subjecte.g. a = 3b + 18.5 8Dep on previous methodor correctly substitutes into the second equation 5(3b + 18.5 )e.g. 8 + 4b = 26.25After M0 scoredSC1 for 2 correct values with no workingor for two values that satisfy one of their original equations |

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