**GCSE Mathematics (9–1) Practice Tests Set 8 – Paper 1H mark scheme**

| **Question** | **Working** | **Answer** | **Marks** | **Notes** |
| --- | --- | --- | --- | --- |
| 1 | a |  | 80 000 | 1 | B1 |  |
|  | b | 0.5 × 105 – 8  **or**  0.0005 **or** 5 × 10*n***or**5.0 × 10*n*  | 5 × 10-4 | 2 | M1 |  |
|  |  |  |  |  | A1 | for 5 × 10-4 or 5.0 × 10-4 |
| 2 | a |  | *y*14 | 1 | B1 |  |
|  | b |  | 16*m*12 | 2 | B2 | if not B2 then B1 for *am*12 **or** 16*mb* **or** 24*m*12 *b* ≠ 0, 12 *a* ≠ 1, 16 |
|  | c | 5*x* + 15 = 3*x* – 4 **or***x* + 3 =   |  oe | 3 | M1 | for removing bracket in a correct equation or dividing all terms by 5 in a correct equation |
|  |  | e.g. 5*x* – 3*x* = −4 – 15 |  |  | M1 | ft from *ax* + *b* = *cx* + *d* for correctly isolating terms in *x* on one side of equation and constant terms on the other side |
|  |  |  |  |  | A1 | dep on at least M1 |
| 3 | a (i) |  | 1, 2, 3, 4, 6, 12 | 1 | B1 | cao |
|  |  (ii) |  | 1, 3, 5, 7, 9, 10, 11 | 1 | B1 | cao |
| 4 | (a)  |  **or** –*ac* = −*M* – *bd* **or**   |  | 2 | M1 | For a correct first stage |
|  |  |  |  |  | A1 | oe, eg ,  [must have been seen with *a* = to award accuracy mark] |
|  | (b) |  oe |  | 2 | M1 | Accept as equation or with the wrong inequality sign. Also award M1 for an answer of 8.6 or 8.6 with an = sign or the incorrect inequality sign. |
|  |  |  |   |  | A1 | Accept  **or**  **or** [−, 8.6) |
|  | (c) | eg , eg eg  |  | 2 | M1 | Any correct partially factorised expression with at least 2 terms in the common factor **or** for the correct common factor and a 2 term expression inside the brackets with just one error |
|  |  |  |  |  | A1 |  |
| 5 | d (i) |  | (*x* – 4)(*x* + 6) | 2 | M1 | for (*x* + *a*)(*x* + *b*) where either *ab* = −24 **or** *a* + *b* = +2e.g (*x* – 6)(*x* + 4)  |
|  |  |  |  |  | A1 |  |
|  | (ii) |  | 4, − 6 | 1 | B1 | cao **or** ft from any (*x* + *p*)(*x* + *q*) |
| 6 | a (i) |  | 54 | 1 | B1 | cao |
|  |  (ii) |  | angle at centre is twice angle at circumference | 1 | B1 | dep on B1 in (a)(i) accept alternative reasonseg. angle at circumference is half the angle at the centre |
|  | b (i) |  | 27 | 1 | B1 | ft from (a)(i) for  |
|  |  (ii) |  | alternate segment theorem | 1 | B1 | dep on B1 in (b)(i) accept alternative reasonangle between tangent and radius is 90o If answer for (b)(i) is ft from (a)(i) then reason must be angle between tangent and radius is 90o  |
| 7 | a | Readings from graph at cf 20 and cf 60eg. readings of 103 and 123 | 20.5 | 2 | M1A1 |  |
|  |  |  |  |  |  | for answer in range 19 – 21 |
|  | b  | Reading from graph from time = 120 (=55) **or** 80 – 55 (=25)  | No with correct figures | 3 | M1 | accept reading in range 55 – 56  |
|  |  | 0.35 × 80 (=28) **or**  e.g.  oe (=31(.25)) **or** oe (= 68(.75))  |  |  | M1 | accept a value in the range 30 – 31.25 **or** a value in the range 68 – 70 for this mark unless clearly from incorrect working  |
|  |  |  |  |  | A1 | eg. No with 28 and 25**or** No with 31.25%(accept value in range 30% – 31.25%) **or** No with 68.75% and 65%(accept value in range 68% – 70%) |
| 8 | (a) |  |  | 2 | B2 | Award B1 for any 3 correct.Decimals must be correct (recurring shown), 0 can be  or the branch crossed out or left blank  |
|  | (b) |  |  | 3 | M1 | Award M1 for one correct product (ft tree diagram) |
|  |  |  **or**  oe **or** 1−  oe |  |  | M1 | A fully correct method (ft tree diagram) |
|  |  |  |  |  | A1 | oe decimals 0.577… or 57.7...% rounded or truncated to 2 or more sf  |
| 9 |  | **and**  **or** 90 – 18  |  | 3 | M1 | For 90° **and** 18° correctly identified in the working or on the diagram **or** for 90 – 18 **or** for other fully correct method |
|  |  |  | 72 |  | A1 |  |
|  |  | Angle between tangent and radius(or diameter) is 90 degrees |  |  | B1 | Correct reason for 90° angle[If used alternate segment theorem] |
| 10 | a |  | −6.5 oe | 1 | B1 |  |
|  | b | 4*y* = 3*x* – 5 **or** 4*x* = 3*y* – 5  | oe | 2 | M1 |  |
|  |  |  |  |  | A1 |  |
|  | c |  oe **or**  f(4) **or** **or**  oe | 1.75 oe | 2 | M1 |  |
|  |  |  |  |  | A1 | for 1.75oe (and no other solution) |
| 11 | (a)  |  **or**  **or**  **or**  |  | 2 | M1 |  |
|  |   |  |  |  | A1 | Accept  |
|  | (b) |  |  | 2 | M1 | for  or for *k* = −6 × 4 + 5 |
|  |  |  |  |  | A1 | Accept  |
| 12 | (a) |  | 3, 4 | 1 | B1 |  |
|  | (b) |  | see graph at end of mark scheme | 3 | B3 | for correct region identified  |
|  |  |  |  |  |  | If not B3 then awardB2 for *x* + *y* = 4 drawn (with no additional lines drawn) **and** a region identified that satisfies at least 3 of the 5 given inequalities |
|  |  |  |  |  |  | If not B2 then awardB1 for line *x* + *y* = 4 drawn NB. May shade wanted or unwanted regions; lines may be solid or dashed |
| 13 | a |   | (13, 12) | 3 | M1 | or coordinates (5 – 2, 8 – 7) (= (3, 1)) assigned to *A*(may be seen in vector form) **or**(13, *y*) or (*x*, 12) given as coordinates for *C* |
|  |  |  **or**  |  |  | M1 | for coordinates (5 – 2 + 10, 8 – 7 + 11) assigned to *C* |
|  |  |  |  |  | A1 |  |
|  | b | e.g. **with**e.g. “58” ÷ 2 (=29)  **and** “203” ÷ 7 (=29)**OR**e.g. **with**e.g. “60” ÷ 2 (=30) **and** “210” ÷ 7 (=30) | Proof | 2 | M1 | may work with *A* and *E*, in which case may need to ft for method mark from (a) |
|  |  |  |  |  | A1 | proof with justification eg.  (**or** ) with *ABE* is a straight line **or** 210 ÷ 60 = 3.5 and 7 ÷ 2 = 3.5 so *ABE* is a straight line |
| 14 | (a) | *R* = *kt*² oe |  | 3 | M1 | Equation consistent with  |
|  |  | eg 10 = *k* × 22 **or** 40 = *k* × 4² **or** *k* = 2½ |  |  | M1 | Substitute values at any point on the graph or find the value of *k*. (Implies first M1.) Allow readings from graph for *t* ± 0.1 and *R* ± 1 |
|  |  |  |  |  | A1 | Award for  if the value of *k* is shown clearly in (a) or (b). |
|  | (b) |   |  | 2 | M1 | ft dep on answer of the form  |
|  |  |  |  |  | A1 | ft dep on answer of the form Simplification of constant is not required. eg accept [allow other clear arguments that clearly shows *t* is inversely proportional to  ] |
| 15 | a (i) |  | 3 × 73 | 1 | B1 | for 3 × 73 oe **or** 1029 |
|  |  (ii) |  | 23 × 35 × 5 × 74 | 1 | B1 | for 23 × 35 × 5 × 74 oe **or** 23 337 720 |
|  | b |  | 4, 2, 1 | 2 | M1 | for *r* = 1 **or** for *p* = 4 **and** *q* = 2**or** correct representation of *C* in terms of prime factors on a Venn diagram  |
|  |  |  |  |  | A1 |  |
| 16 |  |  **or** **or**  **or**  |  oe | 4 | M1 | for any one correct probability |
|  |  |  **or**   |  |  | M1 | for a complete method  |
|  |  |  **or**   |  |  | M1 |  |
|  |  |  |  |  | A1 | for  oe **or** 0.3025 **or**  30.25% |
| 17 |  |  |  | 3 | M1 | indep for (3*x* + 5)(3*x* – 5) |
|  |  | E.g. **or**   |  |  | M1 | for two correct fractions with a common denominatorif there is any expansion at this stage then it must be correct |
|  |  |  |  |  | A1 | accept equivalents eg.  |
| 18 | (a)  |   |  | 2 | M1 | **or** for 45 = 3 × 3 × 5 **and** 20 = 2 × 2 × 5 |
|  |  |  |  shown |  | A1 | dep on M1 cao with sight of but we must see where these come from |
|  | (b) |   |  | 2 | M1 | Rationalise denominator – award for seeing multiplication by   or  |
|  |  |  |  |  | A1 | dep on M1 |
|  | (c) |  |  | 2 | M1 | or  **or** for *a* = **or** *b* = − 19 |
|  |  |  |   |  | A1 |  |
| 19 |  |  **or**  **or** gradient =   |  3*x* + 2*y* = 86 | 5 | M1 |  |
|  |  | (gradient of perpendicular line =)  oe **or**  oe |  |  | M1 | ft from their gradient |
|  |  |  **or** *c* = 43 |  |  | M1 | (dep on previous M1) and ft from their gradient |
|  |  |   |  |  | A1 | correct equation (equation in any form) |
|  |  |  |  |  | A1 | for 3*x* + 2*y* = 86 oe for a simplified equation with integer coefficients e.g. 3*x* = 86 – 2*y*  |

**Question 12**

1

2

3

4

5

6

7

8

9

10

-1

-2

1

2

3

4

5

6

7

8

9

10

-1

-2

0

*x*

*y*

**Practice Tests Set 8 – Paper 1H**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **Edexcel averages:** | **Mean score of students achieving grade** |
| **Question** | **Skills tested** | **Mean score** | **Max score** | **Mean %** | **ALL** | **9** | **8** | **7** | **6** | **5** | **4** | **3** |
| 1a | Standard form | 0.98 | 1 | 98 | 0.98 | 0.99 | 0.99 | 0.99 | 0.98 | 0.97 | 0.95 | 0.94 |
| 1b | Standard form | 1.88 | 2 | 94 | 1.88 | 1.96 | 1.93 | 1.90 | 1.86 | 1.81 | 1.70 | 1.52 |
| 2a | Algebraic manipulation | 0.98 | 1 | 98 | 0.98 | 0.99 | 0.99 | 0.98 | 0.98 | 0.96 | 0.95 | 0.89 |
| 2b | Algebraic manipulation | 1.51 | 2 | 76 | 1.51 | 1.90 | 1.67 | 1.41 | 1.20 | 1.05 | 0.88 | 0.82 |
| 2c | Linear equations | 2.76 | 3 | 92 | 2.76 | 2.95 | 2.89 | 2.82 | 2.73 | 2.53 | 2.09 | 1.62 |
| 3a | Set language and notation | 0.92 | 1 | 92 | 0.92 | 0.98 | 0.97 | 0.94 | 0.89 | 0.81 | 0.73 | 0.60 |
| 3b | Set language and notation | 0.73 | 1 | 73 | 0.73 | 0.94 | 0.85 | 0.71 | 0.57 | 0.43 | 0.29 | 0.21 |
| 4a | Algebraic manipulation | 1.64 | 2 | 82 | 1.64 | 1.95 | 1.86 | 1.72 | 1.48 | 1.11 | 0.71 | 0.33 |
| 4b | Inequalities | 1.73 | 2 | 87 | 1.73 | 1.93 | 1.85 | 1.76 | 1.64 | 1.47 | 1.12 | 0.77 |
| 4c | Algebraic manipulation | 1.34 | 2 | 67 | 1.34 | 1.83 | 1.57 | 1.27 | 0.97 | 0.71 | 0.47 | 0.32 |
| 5a | Quadratic equations | 1.76 | 2 | 88 | 1.76 | 1.98 | 1.95 | 1.88 | 1.66 | 1.35 | 0.86 | 0.56 |
| 5b | Quadratic equations | 0.76 | 1 | 76 | 0.76 | 0.99 | 0.95 | 0.81 | 0.56 | 0.34 | 0.13 | 0.07 |
| 6ai | Circle properties | 0.55 | 1 | 55 | 0.55 | 0.78 | 0.60 | 0.49 | 0.39 | 0.29 | 0.22 | 0.12 |
| 6aii | Circle properties | 0.44 | 1 | 44 | 0.44 | 0.72 | 0.50 | 0.36 | 0.26 | 0.15 | 0.11 | 0.04 |
| 6bi | Circle properties | 0.62 | 1 | 62 | 0.62 | 0.82 | 0.73 | 0.60 | 0.45 | 0.33 | 0.25 | 0.15 |
| 6bii | Circle properties | 0.33 | 1 | 33 | 0.33 | 0.62 | 0.39 | 0.21 | 0.10 | 0.05 | 0.01 | 0.00 |
| 7a | Statistical measures | 1.41 | 2 | 71 | 1.41 | 1.84 | 1.65 | 1.38 | 1.11 | 0.79 | 0.47 | 0.24 |
| 7b | Graphical representation of data | 2.32 | 3 | 77 | 2.32 | 2.79 | 2.57 | 2.30 | 2.05 | 1.69 | 1.30 | 0.81 |
| 8a | Probability | 1.78 | 2 | 89 | 1.78 | 1.97 | 1.94 | 1.86 | 1.72 | 1.45 | 1.05 | 0.61 |
| 8b | Probability | 2.03 | 3 | 68 | 2.03 | 2.73 | 2.48 | 2.09 | 1.48 | 0.82 | 0.34 | 0.12 |
| 9 | Circle properties | 2.04 | 3 | 68 | 2.04 | 2.62 | 2.33 | 2.02 | 1.64 | 1.24 | 0.84 | 0.45 |
| 10a | Function notation | 0.88 | 1 | 88 | 0.88 | 0.97 | 0.95 | 0.92 | 0.84 | 0.71 | 0.55 | 0.38 |
| 10b | Function notation | 1.16 | 2 | 58 | 1.16 | 1.90 | 1.56 | 0.98 | 0.43 | 0.15 | 0.05 | 0.01 |
| 10c | Function notation | 1.54 | 2 | 77 | 1.54 | 1.92 | 1.84 | 1.62 | 1.21 | 0.82 | 0.53 | 0.36 |
|  |  |  |  |  | **Edexcel averages:** | **Mean score of students achieving grade** |
| **Question** | **Skills tested** | **Mean score** | **Max score** | **Mean %** | **ALL** | **9** | **8** | **7** | **6** | **5** | **4** | **3** |
| 11a | Powers and roots | 1.32 | 2 | 66 | 1.32 | 1.92 | 1.62 | 1.22 | 0.85 | 0.47 | 0.28 | 0.17 |
| 11b | Powers and roots | 1.42 | 2 | 71 | 1.42 | 1.89 | 1.63 | 1.35 | 1.05 | 0.82 | 0.53 | 0.45 |
| 12a | Simultaneous linear equations | 0.80 | 1 | 80 | 0.80 | 0.99 | 0.94 | 0.81 | 0.67 | 0.48 | 0.32 | 0.24 |
| 12b | Graphs | 1.59 | 3 | 53 | 1.59 | 2.71 | 2.04 | 1.19 | 0.59 | 0.32 | 0.15 | 0.09 |
| 13a | Vectors | 2.14 | 3 | 71 | 2.14 | 2.87 | 2.59 | 2.12 | 1.54 | 1.02 | 0.54 | 0.19 |
| 13b | Vectors | 0.52 | 2 | 26 | 0.52 | 1.21 | 0.52 | 0.19 | 0.06 | 0.02 | 0.00 | 0.00 |
| 14a | Proportion | 2.03 | 3 | 68 | 2.03 | 2.90 | 2.60 | 2.06 | 1.19 | 0.57 | 0.19 | 0.07 |
| 14b | Proportion | 0.53 | 2 | 27 | 0.53 | 1.19 | 0.55 | 0.21 | 0.06 | 0.01 | 0.00 | 0.01 |
| 15ai | Powers and roots | 0.66 | 1 | 66 | 0.66 | 0.95 | 0.81 | 0.61 | 0.42 | 0.26 | 0.12 | 0.08 |
| 15aii | Powers and roots | 0.46 | 1 | 46 | 0.46 | 0.84 | 0.54 | 0.31 | 0.17 | 0.08 | 0.04 | 0.04 |
| 15b | Powers and roots | 1.01 | 2 | 51 | 1.01 | 1.65 | 1.18 | 0.80 | 0.50 | 0.34 | 0.20 | 0.17 |
| 16 | Probability | 1.83 | 4 | 46 | 1.83 | 3.05 | 2.18 | 1.47 | 0.87 | 0.46 | 0.20 | 0.08 |
| 17 | Algebraic manipulation | 0.89 | 3 | 30 | 0.89 | 1.85 | 0.90 | 0.51 | 0.24 | 0.11 | 0.04 | 0.03 |
| 18a | Applying number | 1.00 | 2 | 50 | 1.00 | 1.68 | 1.27 | 0.81 | 0.41 | 0.19 | 0.10 | 0.05 |
| 18b | Applying number | 0.82 | 2 | 41 | 0.82 | 1.65 | 0.98 | 0.46 | 0.18 | 0.08 | 0.02 | 0.01 |
| 19 | Graphs | 1.36 | 5 | 27 | 1.36 | 3.37 | 1.16 | 0.41 | 0.13 | 0.05 | 0.02 | 0.00 |
|  |  | **50.47** | **80** | **63** | **50.47** | **69.79** | **57.52** | **46.55** | **36.13** | **27.31** | **19.35** | **13.62** |

**Suggested Grade Boundaries based on peformance of students in Summer 2018**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **9** | **8** | **7** | **6** | **5** | **4** | **3** |
| 61 | 51 | 41 | 32 | 24 | 16 | 12 |