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| **GCSE Mathematics (9-1) Practice Tests** | | | | **Set 8 – Paper 2H mark scheme** | | | |
|  |  |  |  | |  |  |  |
| Question | | **Working** | **Answer** | | **Marks** | | **Notes** |
| 1 |  | (=230) **or** **or** **or** |  | | 3 | M1 |  |
|  |  | (7 – 2) × “230” **or** 7 × “230” – 2 × “230” **or** “1610” – “460” **or** |  | |  | M1 |  |
|  |  |  | 1150 | |  | A1 |  |
| 2 |  | (=1600) |  | | 4 | M1 |  |
|  |  | (=21600)  **or** (20 000 – 19200) + (=2400) |  | |  | M1 | Award M2 for  or  21600 |
|  |  | **or** **or** “21600” ÷ 19200 (×100) oe |  | |  | M1 | or for 1.125 or  or 112.5% |
|  |  |  | 12.5 | |  | A1 | oe |
| 3 |  | 170 ÷ 2 (=85) **or** 170 ÷ 2 × 7 (=595) **or** 7 ÷ 2 (=3.5) | 510 | | 5 | M1 |  |
|  |  | 7 × “85” + 170 (=765) **or** 9 × “85” (=765) **or** “595” + 170 (=765) **or** 170 × “3.5” + 170 (=765) |  | |  | M1 | award of this mark implies the first M1 |
|  |  | “765” ÷ 3 (=255) **or**  "765" ÷ 3 × 5 (=1275) |  | |  | M1 | dep on M2 |
|  |  | “255” × 2 **or** “1275” – “765” **or**  “1275” ÷ 5 × 2 |  | |  | M1 |  |
|  |  |  |  | |  | A1 |  |
| Question | | **Working** | **Answer** | | **Marks** | | **Notes** |
| 4 | (a) | 2 × × 0.56 × 1.6 |  | | 2 | M1 | Award even if part of a calculation including 1 or 2 circles |
|  |  |  | 5.63 | |  | A1 | awrt 5.63 |
|  | (b) | (=0.375) **or**  (==) **or**   **or**   **or** 0.56 ÷  oe |  | | 2 | M1 | Correct scale factor (given as a fraction or ratio) or correct equation in *r* or a correct expression for *r*.  Allow 2.6666... to 1 dp rounded or truncated |
|  |  |  | 0.21 | |  | A1 | Allow 21 cm oe if units shown |
| 5 |  | 9.72 + 3.52 (=106.34) | 32.4 | | 4 | M1 | M1 for the use of *MN* and a correct angle (70.1… or 70.2, 19.8…) in a correct trig statement  eg cos70.2= |
|  |  | or  (=10.3…) |  | |  | M1 | M1 for a complete method to find *MN*  eg *MN*=(=10.3…) |
|  |  | π × “10.3…” **or** 2 × π × |  | |  | M1 | dep on M2 |
|  |  |  |  | |  | A1 | for answer in range 32.3 – 32.41 |
| Question | | **Working** | **Answer** | | **Marks** | | **Notes** |
| 6 |  | **or** sin 38 = |  | | 3 | M1 | Or use of tan to find horizontal side 12.6 × tan 52 or  (=16.12...) **and** a correct first stage to find *x* eg  *x*² = 12.6² + “16.12...”²or  oe  Allow correct first stage of sine rule |
|  |  | **or**  (=) **or** |  | |  | M1 | Accept decimal correct to at least 3SF  Or (*x* =) **or**  (*x* = )  Allow fully rearranged sine rule |
|  |  |  | 20.5 | |  | A1 | 20.4 – 20.5 |
| 7 |  | eg 7*x* + 7*y* = 105 − 5*x* + 5*y* = 75 +  7*x* – 5*y* = 3 7*x* – 5*y* = 3      7(15 – *y*) – 5*y* = 3 **or** 7*x* – 5(15 – *x*) = 3 oe |  | | 3 | M1 | Correct method to eliminate *x* or *y*: coefficients of *x* or *y* the same **and** correct operation to eliminate selected variable (condone any  one arithmetic error in multiplication) **or**  writing *x* or *y* in terms of the other variable and correctly substituting |
|  |  | “6.5” + *y* = 15 **or** *x* + “8.5” = 15 **or** 7 × “6.5” – 5y = 3 **or** 7*x* – 5 × “8.5” = 3 |  | |  | M1 | dep Correct method to find second variable using their value from a correct method to find first variable or for repeating above method to find second variable |
|  |  |  | *x* = 6.5, *y* = 8.5 | |  | A1 | dep on first M1 |
| Question | | **Working** | **Answer** | | **Marks** | | **Notes** |
| 8 | a | × 160 000 oe (=6400) | 141 558 | | 3 | M1 | M2 for 160 000 × 0.963  **or** 160 000 × 0.964  (=135 895.44..))  If not M2 then award  M1 for 160 000 ×0 .96  **(=**153 600)  **or** 160 000 × 0.962  (=147 456) |
|  |  | × (160 000 – “6400”) (= 6144)  × (160 000 – “6400” – “6144”) (= 5898.24) 160 000 – “6400” – “6144” − “5898.24” |  | |  | M1 | for a complete  method (condone 4 years rather than 3) |
|  |  |  |  | |  |  | accept (1 – 0.04) in place of 0.96 throughout |
|  |  |  |  | |  | A1 | for 141 557.76 - 141 558 |
|  | b | E.g. 252 000 ÷ 1.05 | 240 000 | | 3 | M2 | If not M2  then M1 for  *x* × 1.05 = 252 000 **or**  252 000 ÷ 105 oe |
|  |  |  |  | |  | A1 | NB: An answer of 239 400 scores M0 M0 A0 |
| Question | | **Working** | **Answer** | | **Marks** | | **Notes** |
| 9 |  | E.g. **or  or**  **or** | 110 | | 5 | M1 | substitutes correctly into a trig ratio  (including the Sine rule) |
|  |  | E.g.(shortest side) =  **or** 12.8tan(90 – 72) **or** 4.15(89…) **or** 4.16 **or** (hypotenuse = )  **or**  **or**  13.4(58…) **or** 13.5 |  | |  | M1 | for a complete method to find one side of the triangle |
|  |  | **One of** (shortest side = ) **or** 12.8tan(90 – 72) **or** 4.15(89…) **or** 4.16 **or**  **AND** **One of** (hypotenuse = )  **or**  **or**  13.4(58…) **or** 13.5 **or** |  | |  | M1 | for a complete method to find both missing sides of triangle  NB Could use Pythagoras’s theorem with side found – must be a complete correct method |
| Question | | **Working** | **Answer** | | **Marks** | | **Notes** |
| 10 |  | (= 14.1(37)… or ) |  | | 3 | M1 | Correct expression for volume. |
|  |  | oe |  | |  | M1 | dep |
|  |  |  | 7.75 | |  | A1 | 7.75 – 7.78 |
| 11 |  | 2*x*2 – *x* + 6*x* – 3 **or** 2*x*2 + 5*x* – 3 **or**  *x*2 + 3*x* – 5*x* – 15 **or** *x*2 – 2*x* – 15 **or**  2*x*2 – 10*x* – *x* + 5 **or** 2*x*2 – 11*x* + 5 | 2*x*3 – 5*x*2 – 28*x* + 15 | | 3 | M1 | for expansion of any 2 of the 3 brackets (at least 3 of 4 terms correct) |
|  |  | eg.  2*x*3 + 5*x*2 – 3*x* – 10*x*2 – 25*x* + 15 **or**  2*x*3 – 4*x*2 – 30*x* –*x*2 + 2*x* + 15 **or**  2*x*3 – 11*x*2 + 5*x* + 6*x*2 – 33*x* + 15 |  | |  | M1 | (dep) ft for at least half of their terms correct in second expansion (the correct number of terms **must** be present) |
|  |  |  |  | |  | A1 |  |
| 12 | (a) | (28 + 32) × 72.6 (=4356) **or** 28 × 75 (=2100) |  | | 4 | M1 | Expression for total of both classes together or total for class A |
|  |  | (28 + 32) × 72.6 – 28 × 75 (=2256) |  | |  | M1 | Expression for total of class B |
|  |  | (=”2256” ÷ 32) |  | |  | M1 | Correct calculation for mean of  class B |
|  |  |  | 70.5 | |  | A1 |  |
|  | (b) | Highest in A = 39 + 57 (= 96) Highest in B = 33 + 60 (= 93) |  | | 3 | M1 | for 39 + 57(=96) **or** 33 + 60(=93) |
|  |  | (39 + 57) – 33 |  | |  | M1 | or for 33 – “96” or 33 to “96” oe |
|  |  |  | 63 | |  | A1 |  |
| 13 |  |  |  | | 2 | M1 | For either bound correct (used or seen). Accept |
|  |  |  | 7.65 | |  | A1 | dep on correct method shown |
| Question | | **Working** | **Answer** | | **Marks** | | **Notes** |
| 14 |  | (= 100 + 576 + 64 = 740)  (*BE* = =27.202 …) | (=64 + 576 = 640)  (*BD* = = 25.298….) | | | M1 | Complete method to find *BE* or*BE*2  or *BD* or *BD*2 |
|  |  | (= 0.3676 …) | (= 0.3952…)  **or**  cos *DBE* =  (=0.9428…) | | | M1 | Allow use of sine or cosine rule  **or**  (=0.9299...) |
|  |  |  | 21.6 | |  | A1 | 21.5 – 21.6 |
| Question | | **Working** | **Answer** | | **Marks** | | **Notes** |
| 15 | (a) |  | -6, 4, 0, -2, 4 | | 2 | B2 | Award B1 for 2, 3 or 4 correct. |
|  | (b) |  | correct curve | | 2 | B2 | For correct smooth curve.  If B2 not awarded, award B1 for at least 5 points plotted correctly ft from table dep on B1 or B2 in (a) (plots ±1 sq) |
|  | (c) | *x*³ − 2*x*² − 3*x* + 4 = −2*x* + 3 |  | | 4 | M1 |  |
|  |  | Plot *y* = −2*x* + 3 |  | |  | M1 | Sufficient to cross curve at least once. |
|  |  | -0.8 or 0.6 or 2.2 |  | |  | A1 | Any one correct *x* value at intersection of graphs (or one or more points given as coordinates)  ft dep on second M1 (Award even if curve in (a) is incorrect) |
|  |  |  | −0.8, 0.62.2 | |  | A1 | Accept −0.9 to −0.7  Accept 0.4 to 0.7  Accept 2.1 to 2.4  (not coordinates)  ft (±1 square) dep on second M1 must be 3 values |
| 16 |  | E.g.  **or**  **or**  **or**  **or**  **or**  with 2 of *k* = oe ,  *a* = 2, *b* = 5  **or**  with 2 of *m* = 4, *a* = 2, *b* = 5 |  | | 2 | M1 | for a correct first step leading to a correct partially simplified expression |
|  |  |  |  | |  | A1 | for  **or** **or**  **or** 0.25*y*2*x*-5 |
| Question | | **Working** | **Answer** | | **Marks** | | **Notes** |
| 17 |  | eg 4 × 5 + 1 × 10 = 30 small squares for 6 babies **or** 30 ÷ 6 **or** 5 small squares represent 1 baby **or**  height of first bar  (= 8) **or**  height of last bar (=2) **or**  1 small square vertically = FD of 2 **or**  1cm vertically = FD of 10 oe |  | | 3 | M1 | Start working with area being proportional to frequency or show the height of the first or last bar or show a correct scale on the frequency density scale, with no inconsistent values.  eg could be awarded by seeing total of little squares ÷ 5 oe |
|  |  | eg (4 × 5 + 20 × 4 + 25 × 2 + 15 × 4) ÷ 5 **or** 4 + 40 × 0.4 + 50 × 0.2 + 30 × 0.4  **or**  4 + 16 + 10 + 12 oe |  | |  | M1 | Fully correct method, allow one error in products but must be the sum of 4 parts |
| 18 |  | = 180 − 42 (=138) |  | | 5 | M1 | May be marked on diagram. |
|  |  | (2 × 6 – 4) × 90 (=720) |  | |  | M1indep | Method to find sum of interior angles of hexagon **or** the correct sums for the interior angles of shapes used (eg 540° & 180° if the line through *FE* to point on *AB* drawn or 720° and 180° if line drawn from *E* parallel to *AB* or 540° & 180° if line through *FE* extended and joined to line through CB extended) oe |
|  |  | eg “138” + 42 + 50 + 96 + 144 + *E*ʹ = “720”  **or** “138” + 42 + 50 + 96 + 144 + (360 – *E*) = “720”  **or** 42 + 144 + “138” + (50 + 96) + *DEP* = “540” (where *P* is on *AB* and *FE* extended) |  | |  | M1 | dep on previous M marks  Equation for *E* or  where *E* is the obtuse angle of the hexagon andis the interior (reflex) angle  **or** for an answer of 250 from correct working |
|  |  | Eʹ = “720” – “138” – 42 −50 – 96 – 144  (= 720 – 470 = 250)  **and** *E* = 360 – “250”  **or** *E* = “138” + 42 + 50 + 96 + 144 + 360 – “720” (= 830 – 720) |  | |  | M1 | A completely correct calculation for the correct angle *E* |
|  |  |  | 110 | |  | A1 | from no incorrect working |
| Question | | **Working** | **Answer** | | **Marks** | | **Notes** |
| 19 |  | 14² = 10² + 8² − 2 × 10 × 8 × cos*A* **or**  oe |  | | 3 | M1 | Correct substitution in cosine rule for **any** angle or for 44.4... or 34.047....(the other 2 angles to 1dp or better) |
|  |  |  |  | |  | M1 | oe ie cos-1 of the correct angle **or** a fully correct method to find the largest angle eg  oe |
|  |  |  | 101.5 | |  | A1 | 101.5 to 101.6 |
| 20 |  | **or** 0.216 **or** 125 – 98 (=27) | oe | | 4 | M1 |  |
|  |  | **or** |  | |  | M1 | for the length scale factor  may be seen as a ratio E.g. 3 : 5 |
|  |  | **or** *h* −  oe |  | |  | M1 |  |
|  |  |  |  | |  | A1 | for  oe (may not be simplified) |

**Practice Tests Set 8 – Paper 2H**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  |  |  |  |  | **Edexcel averages:** | **Mean score of students achieving grade** | | | | | | |
| **Question** | **Skills tested** | **Mean score** | **Max score** | **Mean %** | **ALL** | **9** | **8** | **7** | **6** | **5** | **4** | **3** |
| Q01 |  |  | 3 |  |  |  |  |  |  |  |  |  |
| Q02 |  |  | 4 |  |  |  |  |  |  |  |  |  |
| Q03 | Ratio and proportion | 3.91 | 5 | 78 | 3.91 | 4.63 | 4.29 | 3.86 | 3.46 | 2.99 | 2.38 | 1.71 |
| Q04a | 3D shapes and volume | 1.86 | 2 | 93 | 1.86 | 1.92 | 1.91 | 1.88 | 1.87 | 1.79 | 1.66 | 1.48 |
| Q04b | Similarity | 1.77 | 2 | 89 | 1.77 | 1.98 | 1.94 | 1.85 | 1.72 | 1.45 | 0.96 | 0.46 |
| Q05 | Pythagoras' Theorem | 3.47 | 4 | 87 | 3.47 | 3.90 | 3.80 | 3.59 | 3.30 | 2.82 | 1.99 | 1.14 |
| Q06 | Trigonometry | 2.48 | 3 | 83 | 2.48 | 2.93 | 2.81 | 2.60 | 2.26 | 1.74 | 1.03 | 0.45 |
| Q07 | Simultaneous linear equations | 2.57 | 3 | 86 | 2.57 | 2.97 | 2.88 | 2.71 | 2.37 | 1.90 | 1.18 | 0.54 |
| Q08 | Trigonometry | 3.70 | 5 | 74 | 3.70 | 4.78 | 4.40 | 3.84 | 2.94 | 1.91 | 0.87 | 0.32 |
| Q08a | Percentages | 2.57 | 3 | 86 | 2.57 | 2.91 | 2.78 | 2.60 | 2.39 | 2.10 | 1.64 | 1.27 |
| Q08b | Statistical measures | 2.39 | 3 | 80 | 2.39 | 2.92 | 2.75 | 2.44 | 2.06 | 1.53 | 1.01 | 0.45 |
| Q10 | Measures | 2.32 | 3 | 77 | 2.32 | 2.85 | 2.62 | 2.34 | 2.05 | 1.59 | 0.98 | 0.51 |
| Q11 | Algebraic manipulation | 2.15 | 3 | 72 | 2.15 | 2.82 | 2.49 | 2.10 | 1.65 | 1.21 | 0.78 | 0.44 |
| Q12a | Statistical measures | 2.40 | 4 | 60 | 2.40 | 3.53 | 2.86 | 2.19 | 1.61 | 0.89 | 0.42 | 0.11 |
| Q12b | Percentages | 2.28 | 3 | 76 | 2.28 | 2.95 | 2.74 | 2.27 | 1.76 | 1.20 | 0.70 | 0.45 |
| Q13 | Degree of accuracy | 1.25 | 2 | 63 | 1.25 | 1.87 | 1.62 | 1.16 | 0.68 | 0.35 | 0.15 | 0.04 |
| Q14 | 3D shapes and volume | 1.67 | 3 | 56 | 1.67 | 2.66 | 2.09 | 1.44 | 0.81 | 0.41 | 0.15 | 0.05 |
| Q15a | Graphs | 1.76 | 2 | 88 | 1.76 | 1.95 | 1.87 | 1.76 | 1.65 | 1.49 | 1.29 | 1.10 |
| Q15b | Graphs | 1.49 | 2 | 75 | 1.49 | 1.80 | 1.61 | 1.46 | 1.30 | 1.11 | 0.88 | 0.67 |
| Q15c | Graphs | 0.65 | 4 | 16 | 0.65 | 1.79 | 0.41 | 0.11 | 0.03 | 0.01 | 0.00 | 0.00 |
| Q16 | Algebraic manipulation | 0.58 | 2 | 29 | 0.58 | 1.28 | 0.57 | 0.27 | 0.12 | 0.06 | 0.03 | 0.01 |
| Q17 | Graphical representation of data | 1.26 | 3 | 42 | 1.26 | 2.15 | 1.41 | 0.99 | 0.63 | 0.36 | 0.17 | 0.05 |
| Q18 | Angles, lines and triangles | 1.80 | 5 | 36 | 1.80 | 3.14 | 2.02 | 1.31 | 0.83 | 0.49 | 0.30 | 0.15 |
| Q19 | Mensuration of 2D shapes | 1.22 | 3 | 41 | 1.22 | 2.37 | 1.39 | 0.73 | 0.38 | 0.17 | 0.06 | 0.03 |
| Q20 | Similarity | 0.63 | 4 | 16 | 0.63 | 1.44 | 0.46 | 0.29 | 0.21 | 0.14 | 0.13 | 0.08 |
|  |  | **52.68** | **80** | **66** | **52.68** | **68.46** | **58.53** | **50.41** | **42.45** | **33.68** | **23.98** | **15.47** |

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **9** | **8** | **7** | **6** | **5** | **4** | **3** |
| 63 | 55 | 47 | 38 | 29 | 20 | 12 |