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|  | |  |  | | --- | --- | | **OCR (9-1) Mathematics**  **Formulae Test (Calculator)**  **Foundation Tier** |  | | **You may use:**   * A scientific or graphical calculator * Geometrical instruments * Tracing paper | **Recommended time:** 40 minutes | |  | | |  |

|  |  |
| --- | --- |
| **Name** |  |

## INSTRUCTIONS

* Use black ink. You may use an HB pencil for graphs and diagrams.
* Complete the box above with your name.
* Answer **all** the questions.
* Read each question carefully before you start to write your answer.
* Where appropriate, your answers should be supported with working. Marks may be given for a correct method even if the answer is incorrect.
* Write your answer to each question in the space provided.
* Additional paper may be used if required.

## INFORMATION

* The total number of marks for this paper is **40**.
* The number of marks is given in brackets **[ ]**.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | |  |  | | --- | --- | |  |  | | **1** | A circle has radius 6 cm.  Calculate its circumference.  Give your answer in centimetres, correct to 1 decimal place.  ......................................... cm **[3]** | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | |  |  | | --- | --- | |  |  | | **2** | Here is a right-angled triangle.  Diagram  Work out the value of x.  *x* = ......................................... **[3]** | |

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|  | |  |  | | --- | --- | |  |  | | **3** | A circle has radius 5 cm.  Work out the area of the circle.  ......................................... cm2 **[2]** | |

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|  | |  |  | | --- | --- | |  |  | | **4** | Here is a right-angled triangle.   |  | | --- | | Diagram |  |  |  | | --- | --- | | Show that angle x is 35°, correct to the nearest degree. | **[3]** | | |

|  |  |  |  |  |  |
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|  | |  |  | | --- | --- | |  |  | | **5** | The diagram below shows five paths.  ADC and DAB are right-angled triangles.  Diagram  It costs £2.50 per metre to clean these paths.  Find the total cost of cleaning all five paths.  £ ......................................... **[6]** | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | |  |  | | --- | --- | |  |  | | **6** | Claudia invests £25 000 at a rate of 2% per year compound interest.  Calculate the total amount of **interest** she will have earned after 5 years.  Give your answer correct to the nearest penny.  £ ......................................... **[4]** | |

|  |  |  |  |  |  |
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|  | |  |  | | --- | --- | |  |  | | **7** | Finn has two bags of counters.  He takes a counter at random from each bag.  The probability that he takes a red counter from the first bag is 0.3.  The probability that he takes a red counter from the second bag is 0.4.  What is the probability that he takes **at least** one red counter?  ......................................... **[4]** | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | |  |  | | --- | --- | |  |  | | **8**  **(a)** | Here are the interest rates for two accounts.  Diagram  Derrick has £10 000 he wants to invest.  Calculate which account would give him most money if he invests his money for 3 years.  Give the difference in the interest to the nearest penny.  **(a)** Account ................. by ................. p **[5]** | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | |  |  | | --- | --- | |  |  | | **(b)** | Explain why he might **not** want to use Account A.  ……………………………………………………………………………………………………………………  ………………………………………………………………………………………….……………………. **[1]** | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | |  |  | | --- | --- | |  |  | | **9** | In the diagram below, ABCD is a trapezium.  Length AE is 37.5 cm.  DE = CF  Find the value of angle x.   |  | | --- | | Diagram |   *x* = ......................................... **[6]** | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  | | --- | --- | |  |  | | **10** | AOB is a sector of a circle, centre O.  Diagram   |  |  | | --- | --- | | Show that the length of arc AB is 5.24 cm, correct to 3 significant figures. | **[3]** | | |

# Mark scheme

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Question** | | | **Answer** | **Marks** | **Part marks** | **Guidance** |
| **1** |  |  | 37.7 cao | **3** | **M1** for 12 ×  oe  **A1** for 37.68 to 37.70[4]  If **A0** scored, **B1** for rounding *their* answer to 1 dp | *Their* unrounded answer must be seen |
|  |  |  | **Total** | **3** |  | |
| **2** |  |  | 21.6[3...] | **3** | **M2** for  soi by  Or **M1** for 122 + 182 implied by 468 | Accept  as final answer for **3** marks  See Appendix |
|  |  |  | **Total** | **3** |  | |
| **3** |  |  | 78.5 to 78.55 | **2** | **B1** for πr2 only seen or used | **0 marks** if 2πr or π*d* and πr2 seen and wrong one used |
|  |  |  | **Total** | **2** |  | |
| **4** |  |  | Shows correct working leading to 34.9[9…] seen [rounding to 35] | **3** | **M2** for  Or **M1** for  or  or  or 0.7 | If using Pythagoras, sin or cos, must have full method  Accept change of variable |
|  |  |  | **Total** | **3** |  | |
| **5** |  |  | 402.89 or 402.90 or 403 | **6** | **M2** for [AC or BD =]  **soi** by 38.078[…] or 38.079  Or **M1** for 352 + 152  **AND**  **M2** for 2 × their ‘38.078[…]’ + 1 × 15 + 2 × 35 (or 161.15…) **oe**  Or **M1** for at least adding their ‘38.078[…]’ + 15 + 35  AND  **M1** for their ‘161.15…’ × 2.5 | 402.894(…) scores **M5** |
|  |  |  | **Total** | **6** |  | |
| **6** |  |  | 2 602.02 cao | **4** | **B3** for 27 602.02 soi by 2 602[.02…] as final answer  Or **M2** for 25 000 × (1.02)5 oe implied by 27 602[.02…]  Or **M1** for 25 000 × (1.02)k oe implied by 26 010 (k ≠ 5 and k ≥ 2) | See Appendix  See Appendix |
|  |  |  | **Total** | **4** |  | |
| **7** |  |  | 0.58 oe | **4** | **M3** for 0.3 × 0.4 + 0.3 × 0.6 + 0.7 × 0.4 or 1 − (0.7 × 0.6)  Or **M2** for two correct products or 0.42  Or **M1** for one correct product  Or **B1** for 0.7 and 0.6 seen (may be on a tree diagram oe) | Implied by 0.12 + 0.18 + 0.28  allow equivalent fractions  0.42 cannot be one of the 2 products as it is a different method |
|  |  |  | **Total** | **4** |  | |
| **8** | **(a)** |  | (Account) A (by) 103[p] | **5** | **B2** for 10 927.27  AND  **B2** for 10 926.24  Or **B1** for 10 400 or 10 712  If **0** scored,  **M1** for 1.033 oe used  **M1** for 1.04, 1.03 and 1.02 used oe |  |
|  | **(b)** |  | He may not want to leave it there for 3 years | **1** | Accept any valid reason |  |
|  |  |  | **Total** | **6** |  | |
| **9** |  |  | 38.7 | **6** | **B3** for 50 for DE or CFnfww  Or  **M1** for 62.52 – 37.52  **M1** for  AND  **B3FT** for correctly evaluated  Or **M2FT** for  Or **M1FT** for | Allow 39  May be in correct place on diagram  2500 implies **M1** |
|  |  |  | **Total** | **6** |  | |
| **10** |  |  | 2 × π × 6 oe implied by 12π    5.235[…] or 5.236[…] or 5.237 which rounds to 5.24 | **M1**  **M1**  **A1** |  | Accept correct alternative methods |
|  |  |  | **Total** | **3** |  | |

**Appendix**

Q2 Alternative

**M1** for 

**M1** for 

OR

**M1** for 

**M1** for  or 

Question 6

Year on year method

Table


Please note – web links are correct at date of publication but other websites may change over time. If you have any problems with a link you may want to navigate to that organisation’s website for a direct search.



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