

Mathematics Assessment

**Band 5 – Test 2**

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**Calculators allowed on questions with this symbol:**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Class: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Teacher: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Remember:

* The test is 1 hour long.
* You **must not** use a calculator for any question in this test without a calculator symbol.
* You will need: compasses, pen, pencil, protractor, rubber and a ruler.
* Some formulae you might need are on the next page.
* Try to answer all questions.
* Write all your answers and working in the spaces provided in this test paper – do not use any rough paper. Marks may be awarded for working.
* Check your work carefully.
* Don’t spend too long on one question. Leave it and try the next one.

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| Formulae Sheet | |
| Perimeter, area, surface area and volume formulae | |
| Sphere | Cone |
|  |  |
| Volume = πr3  Surface Area = 4πr2 | Volume = πr2h  Curved Surface Area = πrl |

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| **A – Ratio and Proportion** | | |
| 1. | In a sale, normal prices are reduced by 25%. The sale price of a saw is £12.75. Calculate the normal price of the saw.  £\_\_\_\_\_\_\_\_\_\_ | / 3 |
| 2. | In a factory, chemical reactions are carried out in spherical containers. The time, *T* minutes, the chemical reaction takes is directly proportional to the square of the radius, *R* cm, of the spherical container. When *R* = 120, *T* = 32. Find the value of *T* when *R* = 150  \_\_\_\_\_\_\_\_\_\_ | / 4 |
| **B – Number** | | |
| 3. | Work out the value of 272/3  \_\_\_\_\_\_\_\_\_\_\_\_ | / 2 |
| 4. | Work out (5 × 104) × (6 × 109)  Give your answer in standard form.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | / 2 |
| **C - Algebra** | | |
| 5. | Complete this table of values for *y* = *x*3 + *x* – 2   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | *x* | –2 | –1 | 0 | 1 | 2 | | *y* | –12 |  |  | 0 |  |   On the grid, draw the graph of *y* = *x*3 + *x* – 2 | / 4 |
| 6. | The diagram shows 3 points *A* (–1, 5), *B* (2, – 1) and *C* (0, 5).  A line **L** is parallel to *AB* and passes through *C*.  Find the equation of the line **L**.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | / 3 |
| 7. | Factorise x² - x - 56  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Solve the equation x² - x – 56 = 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | / 3 |
| 8. | Solve the simultaneous equations  4*x* + 2*y* = 8  2*x* – 5*y* = 10  x = \_\_\_\_\_  y = \_\_\_\_\_ | / 4 |
| 9. | Make *x* the subject of  5(*x* – 3) = *y*(4 – 3*x*)  x = \_\_\_\_\_\_\_\_\_\_\_\_ | / 4 |
| 10. | Solve the inequality 4*p –* 8 < 7 – *p*  \_\_\_\_\_\_\_\_\_\_\_\_ | / 2 |
| **D – Shape, Space and Measure** | | |
| 11. | Diagram **NOT** accurately drawn  *PQRS* is a quadrilateral. *PQ* is parallel to *SR*. *SP* is parallel to *RQ*. Prove that triangle *PQS* is congruent to triangle *RSQ*. | / 3 |
| 12. | Scale: 1 cm represents 2 m  The diagram shows a garden in the shape of a rectangle. Irfan is going to plant a tree in the garden. The tree must be more than 3 metres from the patio **and** more than 6 metres from the centre of the pond. On the diagram, shade the region where Irfan can plant the tree. | / 3 |
| 13. | Diagram **NOT** accurately drawn  Calculate the length of the side *x* in this right-angled triangle. Give your answer correct to 3 significant figures.  x = \_\_\_\_\_\_\_\_\_\_ cm | / 3 |
| 14. | Enlarge A by scale factor ½ from centre (4, 2). Label it B.  Translate A by vector . Label it C. | / 5 |
| 15. | Diagram **NOT** accurately drawn  Calculate the area of the sector. Give your answer correct to 3 significant figures.  \_\_\_\_\_\_\_\_\_\_\_ cm² | / 3 |
| 16. | Diagram **NOT** accurately drawn  The diagram shows a storage tank. The storage tank consists of a hemisphere on top of a cylinder. Calculate the total volume of the storage tank. Give your answer correct to 3 significant figures.  \_\_\_\_\_\_\_\_\_\_\_ cm³ | / 3 |
| 17. | Diagram **NOT** accurately drawn  *BE* is parallel to *CD*. *ABC* and *AED* are straight lines. *AB* = 4 cm, *BC* = 6 cm, *BE* = 5 cm, *AE* = 4.8 cm.  Calculate the length of *CD*.  \_\_\_\_\_\_\_\_\_ cm  Calculate the length of *ED*.  \_\_\_\_\_\_\_\_\_ cm | / 4 |
| **E – Data Handling** | | |
| 18. | Andy did a survey of the number of cups of coffee some pupils in his school had drunk yesterday. The frequency table shows his results.   |  |  |  | | --- | --- | --- | | Number of cups of coffee | Frequency |  | | 2 | 1 |  | | 3 | 3 |  | | 4 | 5 |  | | 5 | 8 |  | | 6 | 5 |  |   Work out the mean number of cups of coffee drunk to 1 decimal place. \_\_\_\_\_\_\_\_ | / 3 |
| 19. | 258 students each study one of three languages. The table shows information about these students.   |  |  |  | | --- | --- | --- | | **Language studied** | | | | **German** | **French** | **Spanish** | | **Male** | 45 | 52 | 26 | | **Female** | 25 | 48 | 62 |     A sample, stratified by the language studied and by gender, of 50 of the 258 students is taken. Work out the number of male students studying Spanish in the sample.  \_\_\_\_\_\_\_\_\_\_\_\_ | / 2 |

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| **F – Probability** | | |
| 20. | There are 3 strawberry yoghurts, 2 peach yoghurts and 4 cherry yoghurts in a fridge. Kate takes a yoghurt at random from the fridge. She eats the yoghurt. She then takes a second yoghurt at random from the fridge. Work out the probability that both the yoghurts were the same flavour.  \_\_\_\_\_\_\_\_ | / 4 |