

Mathematics Assessment

**Band 5 – Test 1**

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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 = $\frac{4}{3}$πr3Surface Area = 4πr2 | Volume = $\frac{1}{3}$ πr2hCurved Surface Area = πrl |

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| **A – Ratio and Proportion** |
| 1. | Toby invested £4500 for 2 years in a savings account. He was paid 4% per annum compound interest. How much did Toby have in his savings account after 2 years?£\_\_\_\_\_\_\_\_\_\_  | / 3 |
| 2. | The shutter speed, *S*, of a camera varies inversely as the square of the aperture setting, *f*. When *f* = 8, *S* = 125. Find a formula for *S* in terms of *f*.\_\_\_\_\_\_\_\_\_\_Hence, or otherwise, calculate the value of *S* when *f* = 4\_\_\_\_\_\_\_\_\_\_ | / 4 |
| **B – Number**  |
| 3. | Work out the value of 163/4\_\_\_\_\_\_\_\_\_\_\_\_ | / 2 |
| 4. | Work out (3.2 × 105) × (4.5 × 104)Give your answer in standard form correct to 2 significant figures.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  | / 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 straight line **L**1 has equation *y* = 2*x* + 3. The straight line **L**2 is parallel to the straight line **L**1. The straight line **L**2 passes through the point (3, 2). Find an equation of the straight line **L**2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  | / 3 |
| 7. | Factorise x² - 7x + 12\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Solve the equation x² - 7x + 12 = 0\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | / 3 |
| 8. | Solve the simultaneous equations3*x* – 4*y* = 132*x* + 3*y* = 3x = \_\_\_\_\_y = \_\_\_\_\_ | / 4 |
| 9. | Rearrange the formula to make *a* the subject.a = \_\_\_\_\_\_\_\_\_\_\_\_ | / 4 |
| 10. | Solve the inequality 5x – 7 < 2x – 1\_\_\_\_\_\_\_\_\_\_\_\_  | / 2 |
| **D – Shape, Space and Measure** |
| 11. |  Diagram **NOT** accurately drawnABCD and DEFG are squares. Prove that triangle CDG and triangle ADE are congruent. | / 3 |
| 12. | Scale: 1 cm represents 10 kmHere is a map. The map shows two towns, Burford and Hightown. A company is going to build a warehouse. The warehouse will be less than 20 km from Burford **and** less than 30 km from Hightown. Shade the region on the map where the company can build the warehouse. | / 3 |
| 13. |  Diagram **NOT** accurately drawnWork out the length of *AB*.Give your answer correct to 3 significant figures.AB = \_\_\_\_\_\_\_\_\_\_ cm | / 3 |
| 14. | Enlarge A by scale factor ½ from centre (-3, -3). Label it B.Translate A by vector $\left[\begin{matrix}5\\3\end{matrix}\right]$. Label it C. | / 5 |
| 15. |  Diagram **NOT** accurately drawnWork out the length of the arc *AB*. Give your answer to 3 significant figures.\_\_\_\_\_\_\_\_\_\_\_ cm  | / 3 |
| 16. | Diagram **NOT** accurately drawn A cone has a base radius of 5 cm and a vertical height of 8 cm. Calculate the volume of the cone. Give your answer correct to 3 significant figures.\_\_\_\_\_\_\_\_\_\_\_ cm³  | / 3 |
| 17. | Diagram **NOT** accurately drawnShapes *ABCD* and *EFGH* are mathematically similar. Calculate the length of *BC*.\_\_\_\_\_\_\_\_\_ cmCalculate the length of *EF*.\_\_\_\_\_\_\_\_\_ cm | / 4 |
| **E – Data Handling** |
| 18. | 20 students scored goals for the school hockey team last month. The table gives information about the number of goals they scored.

|  |  |  |
| --- | --- | --- |
| Goals scored | Number of students |  |
| 1 | 9 |  |
| 2 | 3 |  |
| 3 | 5 |  |
| 4 | 3 |  |

Work out the mean number of goals scored. \_\_\_\_\_\_\_\_\_\_ | / 3 |
| 19. | The table shows the number of boys in each of four groups. Jamie takes a sample of 40 boys stratified by group. Calculate the number of boys from group B that should be in his sample.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Group | A | B | C | D | Total |
| Number of boys | 32 | 43 | 38 | 19 | 132 |

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| **F – Probability** |
| 20. | There are 3 boys and 7 girls at a playgroup. Mrs Gold selects two children at random. Complete the probability tree diagram below.Work out the probability that Mrs Gold selects two girls. \_\_\_\_\_\_ | / 4 |