

Mathematics Assessment

**Band 6 – 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.

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

|  |  |  |
| --- | --- | --- |
| **A – Ratio and Proportion** | | |
| 1. | Convert the recurring decimal 2. to a mixed number. Give your answer in its simplest form.  \_\_\_\_\_\_\_\_\_ | / 3 |
| **B – Number** | | |
| 2. | Sasha drops a ball from a height of d metres onto the ground. The time, t seconds, that the ball takes to reach the ground is given by    where g m/s2 is the acceleration due to gravity.  d = 35.6 correct to 3 significant figures. g = 9.8 correct to 2 significant figures.  Write down the lower bound of d. \_\_\_\_\_\_\_\_\_\_\_    Calculate the lower bound of t correct to 1 decimal place.  \_\_\_\_\_\_\_\_\_\_\_seconds | / 4 |
| 3. | Simplify √72.  \_\_\_\_\_\_\_\_\_\_\_ | / 2 |
| **C - Algebra** | | |
| 4. | *ABCD* is a rectangle. *A* is the point (0, 1). *C* is the point (0, 6).  The equation of the straight line through *A* and *B* is  *y* *=* 2*x* + 1  Find the equation of the straight line through *B* and *C*.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | / 3 |
| 5. | Complete the table of values for y = 2x.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **x** | -2 | -1 | 0 | 1 | 2 | | **y** | ¼ |  | 1 |  |  |   On the grid, draw the graph of y = 2x. | / 4 |
| 6. | Show that the equation x³ - x² + 7 = 0 can be written in the form .  Use the iteration formula starting with to find to 3 decimal places. | / 4 |
| 7. | Factorise 2x² - 5x - 12  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Solve the equation 2x² - 5x – 12 = 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | / 3 |
| 8. | Solve this quadratic equation.  *x*2 – 5*x* – 8 = 0  Give your answers correct to 3 significant figures.  x = \_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_ | / 3 |
| 9. | Show the inequality y > x on the grid below. | / 2 |
| **D – Shape, Space and Measure** | | |
| 10. | Enlarge triangle **A** by scale factor –1, centre *O*. | / 3 |
| 11. | Diagram **NOT** accurately drawn  The length of a pencil is 13 cm. The pencil cannot be broken. Show that this pencil cannot fit inside the cylinder. | / 3 |
| 12. | Diagram **NOT** accurately drawn    Calculate the size of the angle between AG and the face ABCD. Give your answer correct to 1 decimal place.  \_\_\_\_\_\_\_\_\_\_\_º | / 4 |
| 13. | Diagram **NOT** accurately drawn  The diagram shows an equilateral triangle. The area of the equilateral triangle is 36 cm2. Find the value of *x*. Give your answer correct to 3 significant figures.  \_\_\_\_\_\_\_\_\_\_\_cm | / 3 |
| 14. | Diagram **NOT** accurately drawn  The two cylinders, A and B, are mathematically similar. The height of cylinder B is twice the height of cylinder A. The total surface area of cylinder A is 180 cm2. Calculate the total surface area of cylinder B.  \_\_\_\_\_\_\_\_\_\_\_cm² | / 3 |
| **E – Data Handling** | | |
| 15. | Fred did a survey on the areas of pictures in a newspaper. The table gives information about the areas. Work out an estimate for the mean area of a picture.   |  |  |  |  | | --- | --- | --- | --- | | Area (A cm2) | Frequency |  |  | | 0 < *A* ≤ 10 | 38 |  |  | | 10 < *A* ≤ 25 | 36 |  |  | | 25 < *A* ≤ 40 | 30 |  |  | | 40 < *A* ≤ 60 | 46 |  |  |   \_\_\_\_\_\_\_\_\_\_cm² | / 4 |
| 16. | The table gives some information about the time taken by a group of 100 students to complete an IQ test.   |  |  | | --- | --- | | **Time (*t* seconds)** | **Frequency** | | 60 < *t* < 70 | 12 | | 70 < *t* < 80 | 22 | | 80 < *t* < 90 | 23 | | 90 < *t* < 100 | 24 | | 100 < *t* < 110 | 19 |   Write down the modal class interval. \_\_\_\_\_\_\_\_\_\_\_  Find the class interval that contains the median. \_\_\_\_\_\_\_\_\_\_\_ | / 2 |
| **F – Probability** | | |