

Mathematics Assessment

**Bands 5-7 Problem Solving – Test 3**

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

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

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

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

Remember:

* The test is 1 hour long.
* You will need: pen, pencil, rubber and a ruler.
* 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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| 1. | A can of paint is 18 cm tall and holds 2.5 L of paint. A similar can is 1.5 times as tall. How much paint does it hold?  \_\_\_\_\_\_\_\_\_\_\_\_\_ L | / 2 |
| 2. | A spherical ball is made from 20 mm of molten steel. Work out its radius. Give your answer correct to the nearest ml.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ml | / 4 |
| 3. | Manjit bought a house. The value of her house went up by 5% in the first year. In the second year the value went up by 2%. At the end of the two years, her house was worth £171 360. Work out how much Manjit paid for her house originally.  £ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | / 4 |
| 4. | A car, initially travelling at a speed of **u** m/s, accelerates at a constant rate of **a** m/s². The distance **s** travelled in **t** seconds is given by the formula:  s = ut + ½at²  A car joins a motorway travelling at 10 m/s and has a constant accelaration of 0.6 m/s². Work out the distance travelled by the car in 20 seconds.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m | / 4 |
| 5. | The time taken, t (in seconds), to boil a kettle is inversely proportional to the power, p (in watts), of the kettle. A full kettle of power 1500 W boils the water in 400 seconds. A similar kettle has a power of 2500 W. Can this kettle boil the same amount of water in less than 3 minutes? | / 6 |
| 6. | Which 2 of the following lines pass through (0, 3)?   1. y = 3x – 3 2. 4y – 8x = 12 3. 5y = 3x – 15 4. 2x – y = 3 5. 3x + y = 3 | / 5 |
| 7. | Explain why triangles KLN and MLN are **not** congruent. | / 3 |
| 8. | Gerri has a patio that is 4 m by 5 m. She has 10 m² of turf and wants to use it to create a border around the patio that is the same width all the way around. Gerri uses all her turf. Write an equation and solve it to find x.  x = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m | / 7 |

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| 9. | The diagram shows a square of side length x, and a triangle with a vertex at a perpendicular distance y from one side of the square.   1. Find an expression for the shaded area in terms of x and y.   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   1. If y = ½x calculate the percentage of the square that is shaded.   \_\_\_\_\_\_\_\_\_\_\_ %   1. What is the minimum percentage area of the square that can be shaded?   \_\_\_\_\_\_\_\_\_\_\_ %   1. Explain your answer | / 10 |