

Mathematics Assessment

**Band 4 – Test 3**

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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. | A piece of elastic 48 cm long is stretched to 60 cm. What percentage of the original length is the increase?  \_\_\_\_\_\_\_% | / 3 |
| 2. | Ron went to Spain. He changed £200 into Euros (€). The exchange rate was £1 = €1.40. How many Euros did he get?    \_\_\_\_\_\_\_\_\_\_ Euros | / 2 |
| **B – Number** | | |
| 3. | The length of a piece of wood is 123 mm, correct to the nearest mm. What is the greatest length that the piece of wood could be? Circle the correct answer.  123.4mm 122.5mm 123.48mm 124mm 123.5mm | / 1 |
| 4. | Estimate the value of    \_\_\_\_\_\_\_\_\_\_ | / 3 |
| 5. | Evaluate (m5)2  \_\_\_\_\_\_\_ | / 1 |
| 6. | Write 30 000 000 in standard form.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Write 2 × 10–3 as an ordinary number.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | / 2 |
| **C - Algebra** | | |
| 7. | Factorise fully 12g²h – 16gh²  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Expand and simplify (2t + 5)(t – 6)  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | / 4 |
| 8. | Solve 4(2x + 1) = 2(3 – x)  x = \_\_\_\_\_\_\_ | / 3 |
| 9. | Make *q* the subject of the formula *P = 2q + 10*  q = \_\_\_\_\_\_\_\_\_\_\_ | / 2 |
| 10. | Solve the inequality 3*x* + 2 > –7  \_\_\_\_\_\_\_\_\_\_\_ | / 2 |
| **D – Shape, Space and Measure** | | |
| 11. | The size of each interior angle of a regular polygon is 156°. Work out the number of sides of the polygon.  \_\_\_\_\_\_\_\_\_\_\_\_ | / 3 |
| 12. | Use ruler and compasses to construct the bisector of angle *RPQ*. You must show all your construction lines. | / 2 |
| 13. | Enlarge shape A by scale factor 2 from centre (1, 0). Label it B.  Reflect shape A in y = 4. Label it C. | / 5 |
| 14. | The diagram shows three cities. Norwich is 168 km due East of Leicester. York is 157 km due North of Leicester. Calculate the distance between Norwich and York. Give your answer correct to the nearest kilometre.  Diagram **NOT** accurately drawn  \_\_\_\_\_\_\_\_\_\_ km | / 3 |
| 15. | A man left home at 12 noon to go for a cycle ride. The travel graph represents part of the man’s journey.    At 12.45pm the man stopped for a rest. For how many minutes did he rest? \_\_\_\_\_\_\_mins  The man stopped for another rest at 2pm. He rested for one hour. Then he cycled home at a steady speed. It took him 2 hours. Complete the travel graph. | / 3 |
| 16. | Diagram **NOT** accurately drawn  Calculate the surface area of the triangular prism.  \_\_\_\_\_\_\_\_\_\_ cm² | / 3 |
| **E – Data Handling** | | |
| 17. | There are 970 students in Bayton High School. Brian takes a random sample of 100 students. He asks these 100 students which subject they like best. They can choose English or Maths or Science. Brian is going to use his results to work out an estimate of how many of the 970 students like English best. Explain how.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | / 2 |
| 18. | A garage sells motorcycles. The scatter graph shows information about the price and age of the motorcycles.    What type of correlation does the scatter graph show?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Draw a line of best fit on the scatter graph.  Mae buys a motorcycle from this garage for £1500. Use your line of best fit to estimate the age of the motorcycle.  \_\_\_\_\_\_\_\_\_\_\_ years | / 3 |
| 19. | Poppy wants to find out for how much time people use their computer. She uses this question on a questionnaire.  For how much time do you use your computer?  0–1 hours  3–4 hours  1–2 hours  4–5 hours  2–3 hours  5–6 hours  Write down **two** things that are wrong with this question.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Poppy gives her questionnaire to all the students in her class. Her sample is biased. Give **one** reason why.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | / 3 |
| **F - Probability** | | |
| 20. | Loren has two bags. The first bag contains 3 red counters and 2 blue counters. The second bag contains 2 red counters and 5 blue counters. Loren takes one counter at random from each bag. Complete the probability tree diagram. | / 2 |