

Mathematics Assessment

**Bands 3-5 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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| --- | --- | --- |
| 1. | Jim’s pay is £240 each week. Jim asks his boss for an increase of £40 a week. Jim’s boss offers him a 15% increase. Is the offer from Jim’s boss more than Jim asked for? You must show your working. | / 3 |
| 2. | 1. The arrow in position A is rotated into position B. Mark the point P that is the centre of this rotation. 2. The arrow in position A is rotated into position C. Mark the point Q that is the centre of this rotation. | / 2 |

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| --- | --- | --- |
| 3. | In the diagram, all measurements are given in centimetres. All angles are right angles. Show that the perimeter of the shape can be written as 2(3x + 5). | / 4 |
| 4. | Three identical circles fit inside a rectangle. The length of the rectangle is 90cm.    Find the distance between the two centres, A and B.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm | / 3 |
| 5. | Mr Wells’ garden is in the shape of a rectangle. In the garden there is a patio in the shape of a rectangle and two ponds in the shape of circles with diameter 3.8 m. The rest of the garden is grass.    Mr Wells’ is going to spread fertiliser over all the grass. One bag of fertiliser will cover 12 m² of grass. How many bags of fertiliser does Mr Wells need? You must show your working.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | / 5 |
| 6. | A ladder is 6 m long. The ladder is placed on horizontal ground, resting against a vertical wall. The instructions for using the ladder say that the bottom of the ladder must not be closer than 1.5 m from the bottom of the wall. How far up the wall can the ladder reach? Give your answer correct to 1 decimal place.  \_\_\_\_\_\_\_\_\_\_\_ m | / 3 |
| 7. | The table below shows the change in the value of Seesaw plc shares over the last three years.   |  |  |  |  | | --- | --- | --- | --- | | **Year** | 2004 | 2005 | 2006 | | **Change in value** | +25% | -40% | +40% |   *Note: the percentage change each year is based upon the value at the start of that year and the value at the end of that year*  Calculate the percentage change in Seesaw plc shares from the start of 2004 to the end of 2006.  \_\_\_\_\_\_\_\_\_\_\_ % \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | / 4 |
| 8. | Bill uses his van to deliver parcels. For each parcel Bill delivers there is a fixed charge plus £1.00 for each mile. You can use the graph to find the total cost of having a parcel delivered by Bill.    (a) How much is the fixed charge?  £ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Ed uses a van to deliver parcels. For each parcel Ed delivers it costs £2 for each mile. There is no fixed charge.  (b) Use the graph to compare the cost of having a parcel delivered by Bill with the cost of having a parcel delivered by Ed. | / 4 |
| 9. | √20 000 = 141.4 (correct to 1 decimal place)  What is the smallest whole number that has a square root equal to 141.4 (correct to 1 decimal place)?  \_\_\_\_\_\_\_\_\_\_\_\_\_ | / 3 |
| 10. | A cube has edges of 10cm each. Three slices, each of thickness x cm, are cut off the cube.    Slice A is cut off the side, slice B is cut off the top and slice C is cut off the front. What is the volume of each slice in terms of x?  Slice A = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm³  Slice B = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm³  Slice C = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm³ | / 6 |
| 11. | The Hawshaw Summer Fete is running a competition. You buy a scratch card with 9 squares covered up. Under the 9 squares on each card, randomly placed are 4 stars, 3 hearts and 2 LOSE.    Each scratch card costs £1. You scratch off two squares. You win £1.50 if 2 stars are revealed. You win £2 if 2 hearts are revealed.  Michelle buys a scratch card. Work out the probability that this will be a winning scratch card.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_    There are 1440 scratch cards sold at the Fete. All of the proceeds go to charity. Estimate the amount of money raised for charity.  £ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | / 7 |
| 12. | A coffee machine dispenses 130 ml of black coffee into cups with a capacity of 175 ml. These values are accurate to 3 significant figures. Milk is supplied in small cartons which contain 21 ml, accurate to the nearest ml. Beryl likes milky coffee and always puts 2 cartons of milk in her coffee. Will Beryl’s cup ever overflow? You must show your working. | / 6 |