**The tables may need extending so you can fit more trials in.**

Q1 The cubic equation **x3 + x = 24** has a solution between 2 and 3. Copy and complete the table below and use it to find this solution to 1 dp.

|  |  |  |
| --- | --- | --- |
| **Guess (x)** | **Value of x3 + x** | Comment |
| 2 | 23 + 2 = |  |
| 3 | 33 + 3 = |  |
|  |  |  |

Q2 The cubic equation **2x3 – x = 40** has a solution between 2 and 3. Produce a table so that you can find this solution to 1 dp.

Q3 The cubic equation **x3 + x2 – 4x = 3** has three solutions. The first solution lies between

–3 and –2. The second solution lies between –1 and 0. The third solution lies between 1 and 2. Find **two** of the solutions to 1 dp.

## Exam style questions

Q4 This question is about finding a solution to the equation **5x3 = 18** by a ‘Trial and Improvement method’.

1. Copy and complete the entries in the following table

|  |  |
| --- | --- |
| **x** | **5x3** |
| 1.4 | 13.72 |
| 1.5 |  |
| 1.6 |  |
| 1.7 | 24.565 |

(1 mark)

1. Between which two **consecutive** values of x used in the table in (a) would you say the solution to the equation lies? (1 mark)
2. Using a value for x with 2 dp, show how to decide which of your two values in (b) is the solution to the equation correct to 1dp. (2 marks)

Q5 Use Trail and Improvement, or otherwise, to find the positive value of x for which

**x2 – x = 144.** After copying the table, use it to show your working. Give your answer to 1 dp.

(4 marks)

|  |  |  |  |
| --- | --- | --- | --- |
| **Trial no.** | **Trial value** | **x2 - x** | **Comment** |
| 1 | 5 | 20 | Too low |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |

Q1

|  |  |  |
| --- | --- | --- |
| **Guess (x)** | **Value** | **Comment** |
| 2 | 10 | Too low |
| 3 | 30 | Too high |
| 2.5 | 18.125 | Too low |
| 2.8 | 24.752 | Too high |
| 2.7 | 22.383 | Too low |

Solution = 2.8 to 1 dp (4 marks)

###### Q2

|  |  |  |
| --- | --- | --- |
| **Guess (x)** | **Value** | **Comment** |
| 2 | 14 | Too low |
| 3 | 51 | Too high |
| 2.5 | 28.75 | Too low |
| 2.8 | 41.104 | Too high |
| 2.7 | 36.666 | Too low |

Solution = 2.8 to 1 dp (4 marks)

### Q3 Solution one between –3 and –2 = -2.2 to 1 dp

Solution two between –1 and 0 = -0.7 to 1 dp

Solution three between 1 and 2 = 1.9 to 1 dp.

(4 marks per solution, 8 marks)

#### Exam style questions

Q4 a)

|  |  |
| --- | --- |
| **x** | **5x3** |
| 1.4 | 13.72 |
| 1.5 | 16.875 |
| 1.6 | 20.48 |
| 1.7 | 24.565 |

(1 mark)

1. between 1.5 and 1.6 (1 mark)
2. x = 1.55 5x3 = 18.619 (to 3 dp)

this is too high – just! So solution is between 1.5 and 1.55

Solution is 1.5 to 1dp. (2 marks)

Q5

|  |  |  |  |
| --- | --- | --- | --- |
| **Trial no.** | **Trial value** | **x2 - x** | **Comment** |
| 1 | 5 | 20 | Too low |
| 2 | 13 | 156 | Too high |
| 3 | 12 | 132 | Too low |
| 4 | 12.5 | 143.75 | Just too low |
| 5 | 12.6 | 146.16 | Too high |
| 6 | 12.55 | 144.9525 |  |

**Solution is 12.5 to 1 dp** (4 marks)

##### TOTAL / 24