

Trial and Improvement

GCSE MATHS

Name: _____

Teacher: _____

Learning objectives

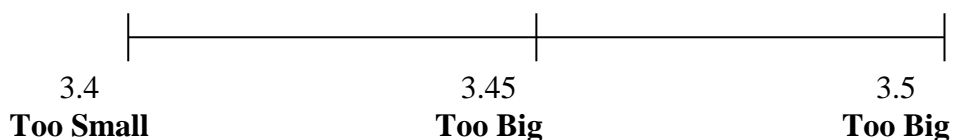
By the end this pack you will be able to:

1. Find approximate solutions to equations using Trial and Improvement

Worked Example:

Find the solution to $x^2 + x = 15$ using Trial and Improvement. Give your answer to one decimal place.

x	$x^2 + x$	<i>Comment</i>
3	$3^2 + 3 = 12$	Too Small
4	$4^2 + 4 = 20$	Too Big
3.5	$3.5^2 + 3.5 = 15.75$	Too Big
3.4	$3.4^2 + 3.4 = 14.96$	Too Small
The answer is between 3.4 and 3.5. We now try the mid-point 3.45		
3.45	$3.45^2 + 3.45 = 15.3525$	Too Big

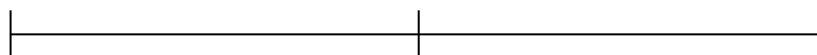


The Answer must lie in this region. Therefore the answer is **3.4 (1 d.p)** $x = 3.4$

Now You Try!

1. Find the solution to $x^2 + x = 47$ using Trial and Improvement. Give your answer to one decimal place.

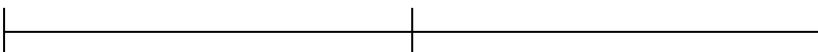
x	$x^2 + x$	<i>Comment</i>
6	$6^2 + 6 = 44$	Too small
7	$7^2 + 7 = 56$	Too.....
6.5	$6.5^2 + 6.5 = 48.75$	Too
6.4		
The answer is between and We now try the mid-point		
	Answer x =	



Answer x =

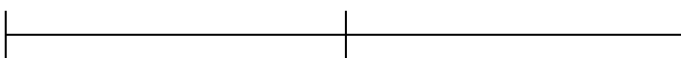
2. Find the solution to $x^2 + 2x = 67$ using Trial and Improvement. Give your answer to one decimal place.

x	$x^2 + 2$	<i>Comment</i>
7		Too small
8		Too big

Answer $x = \dots\dots\dots$ 

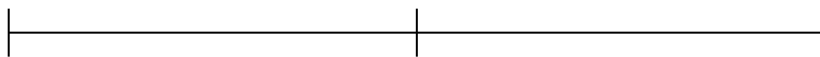
3. Find the solution to $x^3 = 100$ using Trial and Improvement. Give your answer to one decimal place.

x	x^3	<i>Comment</i>


 Answer $x = \dots\dots\dots$

4. Find the solution to $x^3 + 10 = 60$ using Trial and Improvement. Give your answer to one decimal place.

x	x^3	<i>Comment</i>



Exercise

Use Trial and Improvement to solve:

1) $x^3 + 4x = 45$ 1dp $x = 3$ and $x = 4$

Exercise

Use Trial and Improvement to solve:

2) $x^3 - 3x = 20$ 1dp $x = 3$ and $x = 4$

Exercise

Use Trial and Improvement to solve:

3) $x^3 - 5x = 90$ 2dp $x = 4$ and $x = 5$

Homework Exam Question.

The diagram shows a cube and a cuboid.

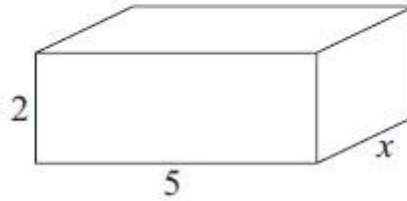
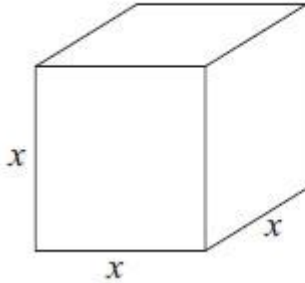


Diagram **NOT**
accurately drawn

All the measurements are in cm.

The volume of the cube is 100 cm^3 more than the volume of the cuboid.

(a) Show that $x^3 - 10x = 100$

(2)

(b) Use a trial and improvement method to find the value of x .

Give your answer correct to 1 decimal place.

You must show **all** your working.

$x = \dots\dots\dots$

(4)

(Total for Question is 6 marks)