



Name	
Date	
Class	
Mark	

Teacher Comments/Notes:

A Level Further Maths

Decision 1 – Year 1

Introduction to Algorithms and Flowcharts

Instructions:

- Answer all questions.
- You may use a calculator.
- The booklet 'Mathematical Formulae and Statistical Tables' may be used.

Information:

- There are 5 questions within this worksheet.

Advice:

- Check your answers against the model solutions found on our website.
- You can find video examples for questions featured within this worksheet over on our website or by visiting our YouTube channel.



1.

The steps below describe an algorithm.

Step 1: Let $n = 1, A = 1, B = 1$

Step 2: Print A and B

Step 3: Let $C = A + B$

Step 4: Print C

Step 5: Let $n = n + 1, A = B, B = C$

Step 6: If $n < 5$ go to step 3.

Step 7: If $n = 5$ stop

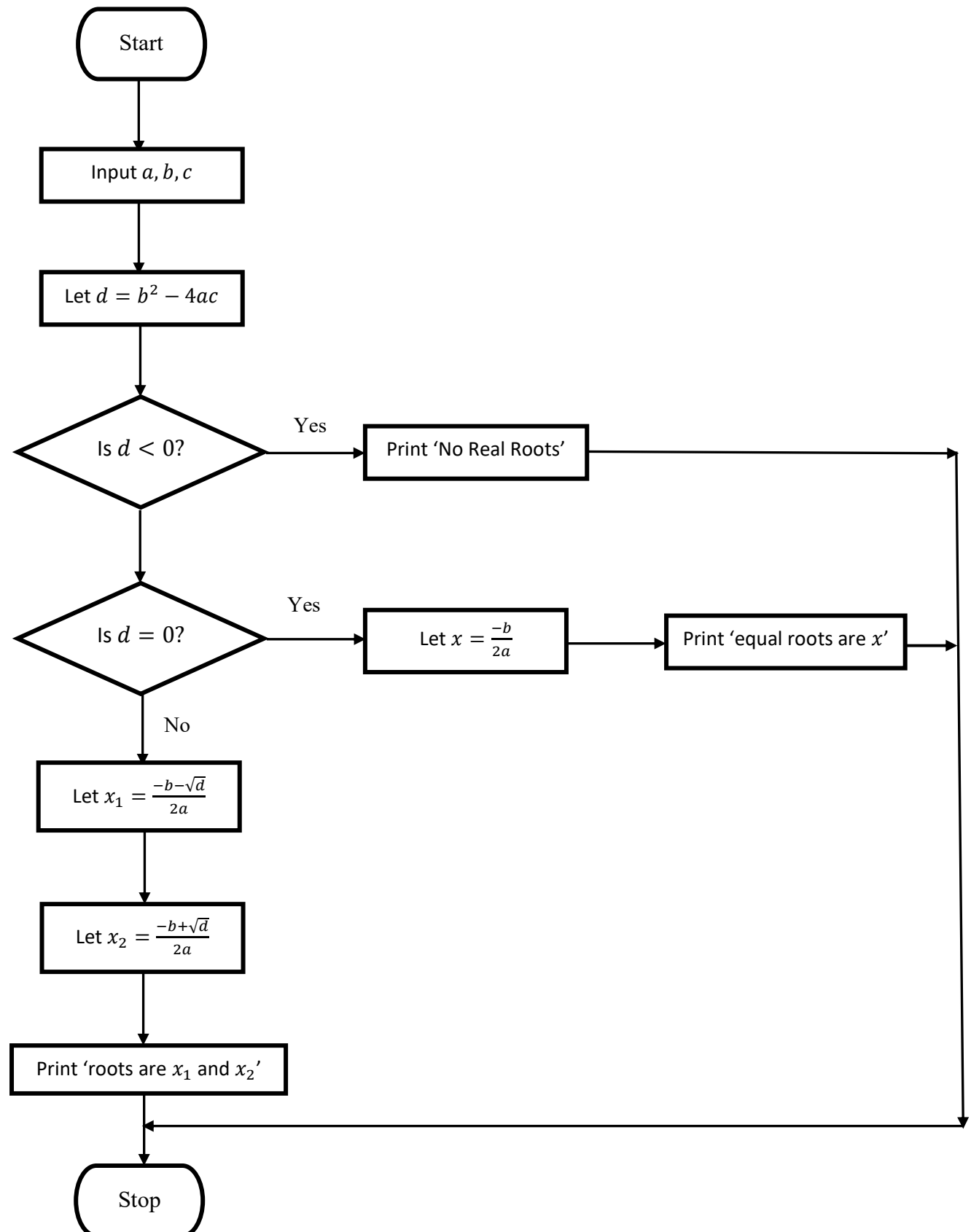
(a) Implement this algorithm.

(b) Describe the numbers produced by this algorithm.



2.

The flow chart below can be used to find the roots of an equation of the form $ax^2 + bx + c = 0$





3.

The steps below describe an algorithm

Step 1: Let $n = 1$ and $A = 1$

Step 2: Print A

Step 3: Let $A = A + 3n + 1$

Step 4: Let $n = n + 1$

Step 5: If $n \leq 8$ go to step 2.

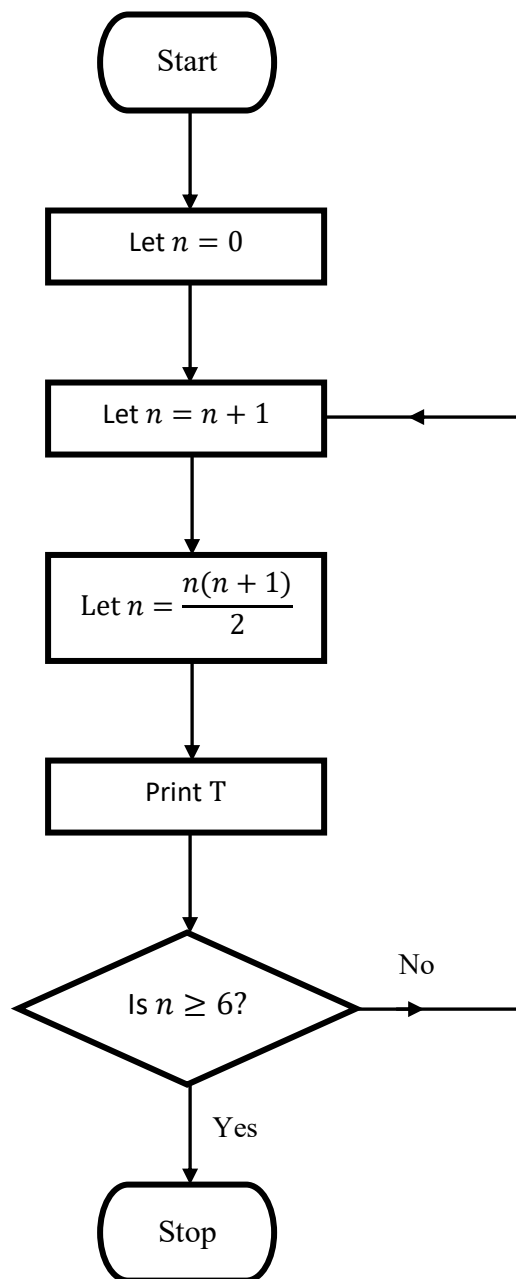
Step 7: If $n = 5$ stop

(a) Implement the algorithm

(b) Describe the numbers produced by this algorithm.



4.



(a) Implement this algorithm using a trace table.

(b) Describe the sequence of numbers printed by the algorithm.



5.

The 196 algorithm works as follows:

Step 1: Write down a positive integer

Step 2: Reverse its digits and add this reversed number to the original number

Step 3: Repeat this process with the resulting number

Step 4: Stop when the result is a palindrome: a number that reads the same forwards and backwards.

(a) Implement this algorithm starting with 48

(b) Implement this algorithm starting with 59.

(c) Which of the two starting numbers requires more repetitions to reach a palindrome.