

3. In this question, the function $\text{INT}(X)$ is the largest integer less than or equal to X .

For example,

$$\text{INT}(5.7) = 5$$

$$\text{INT}(8) = 8$$

$$\text{INT}(-2.3) = -3$$

Consider the following algorithm.

Step 1 Input N

Step 2 Calculate $A = N \div 10$

Step 3 Let $B = \text{INT}(A)$

Step 4 Calculate $C = B \times 10$

Step 5 Calculate $D = N - C$

Step 6 Output D

Step 7 Replace N by B

Step 8 If $N = 0$ then STOP, otherwise go back to Step 2

(a) Complete the table in the answer book, using $N = 4217$, to show the results obtained at each step of the algorithm.

(4)

(b) Explain how the output values of the algorithm relate to the original input N , where N is any positive integer.

(2)

(Total for Question 3 is 6 marks)



5.

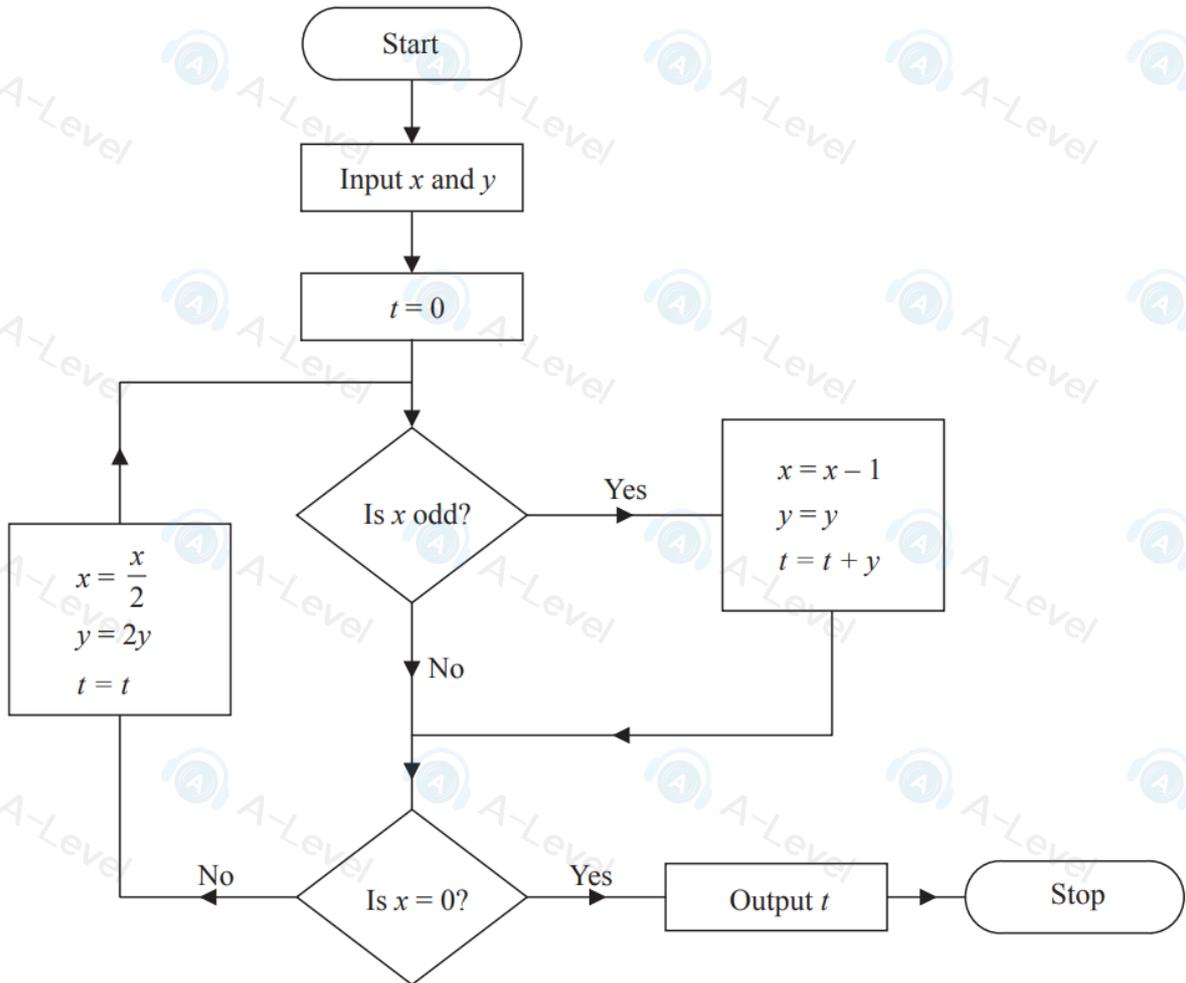


Figure 4

An algorithm is described by the flow chart shown in Figure 4.

Given that $x = 27$ and $y = 5$,

- (a) complete the table in the answer book to show the results obtained at each step when the algorithm is applied. Give the final output. (4)

The numbers 122 and $\frac{1}{2}$ are to be used as inputs for the algorithm described by the flow chart.

- (b) (i) State, giving a reason, which number should be input as x .

- (ii) State the output. (3)

(Total 7 marks)

3.

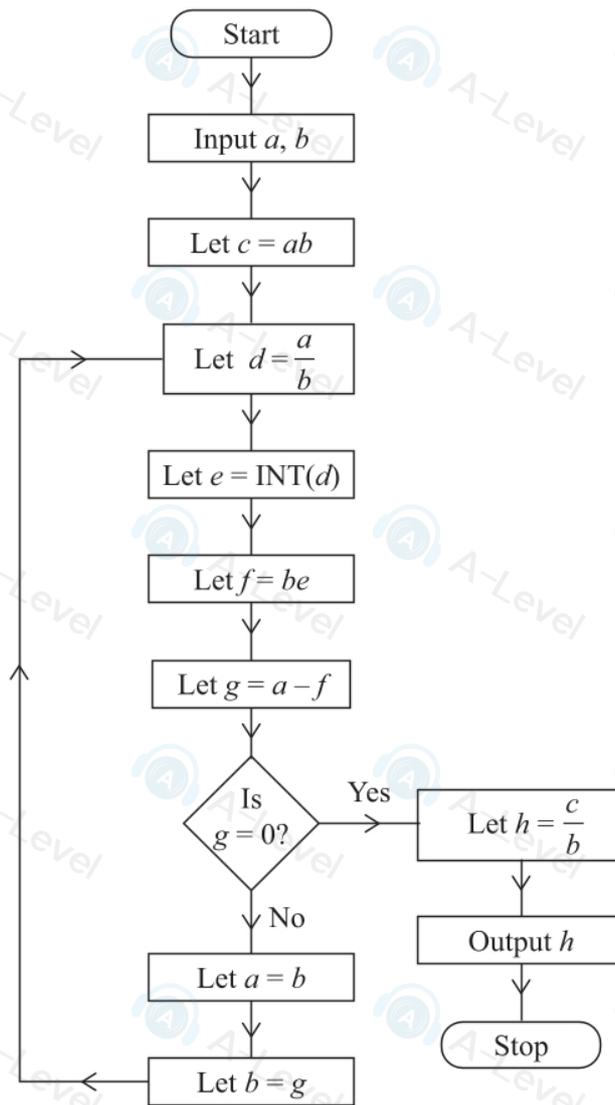


Figure 2

Figure 2 shows the flowchart for an algorithm.
 The input for the algorithm is two positive integers.
 The function $\text{INT}(X)$ is the largest integer less than or equal to X

(a) Complete the table in the answer book, with $a = 1980$ and $b = 462$, showing the results at each step of the algorithm.

(4)

(b) Explain how the output, h , relates to the inputs, a and b

(1)

(Total for Question 3 is 5 marks)

