



Algorithms and Flowcharts

Section 3

Write an algorithm and draw A flowchart that will calculate the roots of A quadratic equation:

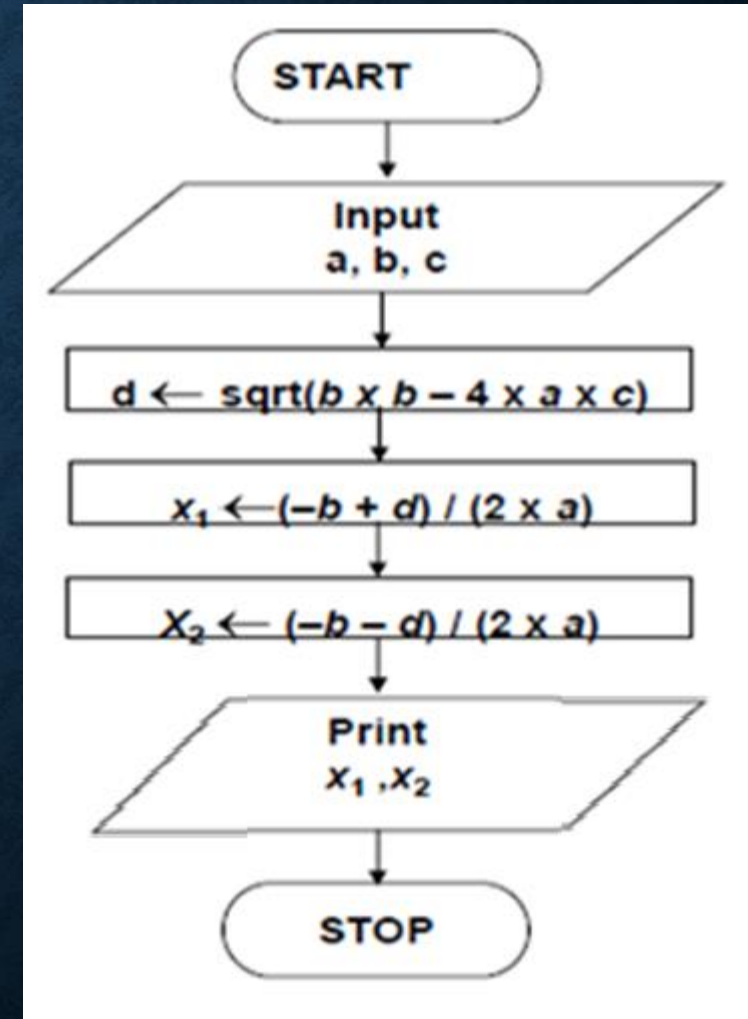
$$ax^2+bx+c=0$$

$d = \sqrt{b^2 - 4ac}$, and the roots are:

$$x_1 = \frac{(-b + d)}{2a} \text{ and } x_2 = \frac{(-b - d)}{2a}$$

Algorithm:

- **Step 1:** Input a, b, c
- **Step 2:** $d = \text{sqrt}(b*b - 4 * a * c)$
- **Step 3:** $x_1 = (-b + d) / (2 * a)$
- **Step 4:** $x_2 = (-b - d) / (2 * a)$
- **Step 5:** Print x1, x2
- **Step 6:** Stop



Algorithm To Find The Largest Of Three Numbers

Step 1: *Input* N1, N2, N3

Step 2: *if* (N1>N2) *then*

if (N1>N3) *then*

MAX N1 [N1>N2, N1>N3]

else

MAX N3 [N3>N1>N2]

end if

else

if (N2>N3) *then*

MAX N2 [N2>N1, N2>N3]

else

MAX N3 [N3>N2>N1]

end if

endif

Step 3: *Print* "The largest number is", MAX

Step4: *Stop*

Another method

Step-1 Start

Step-2 Read three numbers say num1,num2, num3

Step-3 **if** (num1>num2) and (num1>num3) **then**

Print num1 is largest

Else if (num2>num1) and (num2>num3) **then**

Print num2 is largest

Else

Print num3 is largest

End if

End if

Step-4 Stop

Write an algorithm to determine a student's final grade and indicate whether it is passing or failing. The final grade is calculated as the average of four marks.

Algorithm

Step 1: Input M1,M2,M3,M4

Step 2: $GRADE = (M1+M2+M3+M4)/4$

Step 3: if (GRADE < 60) then

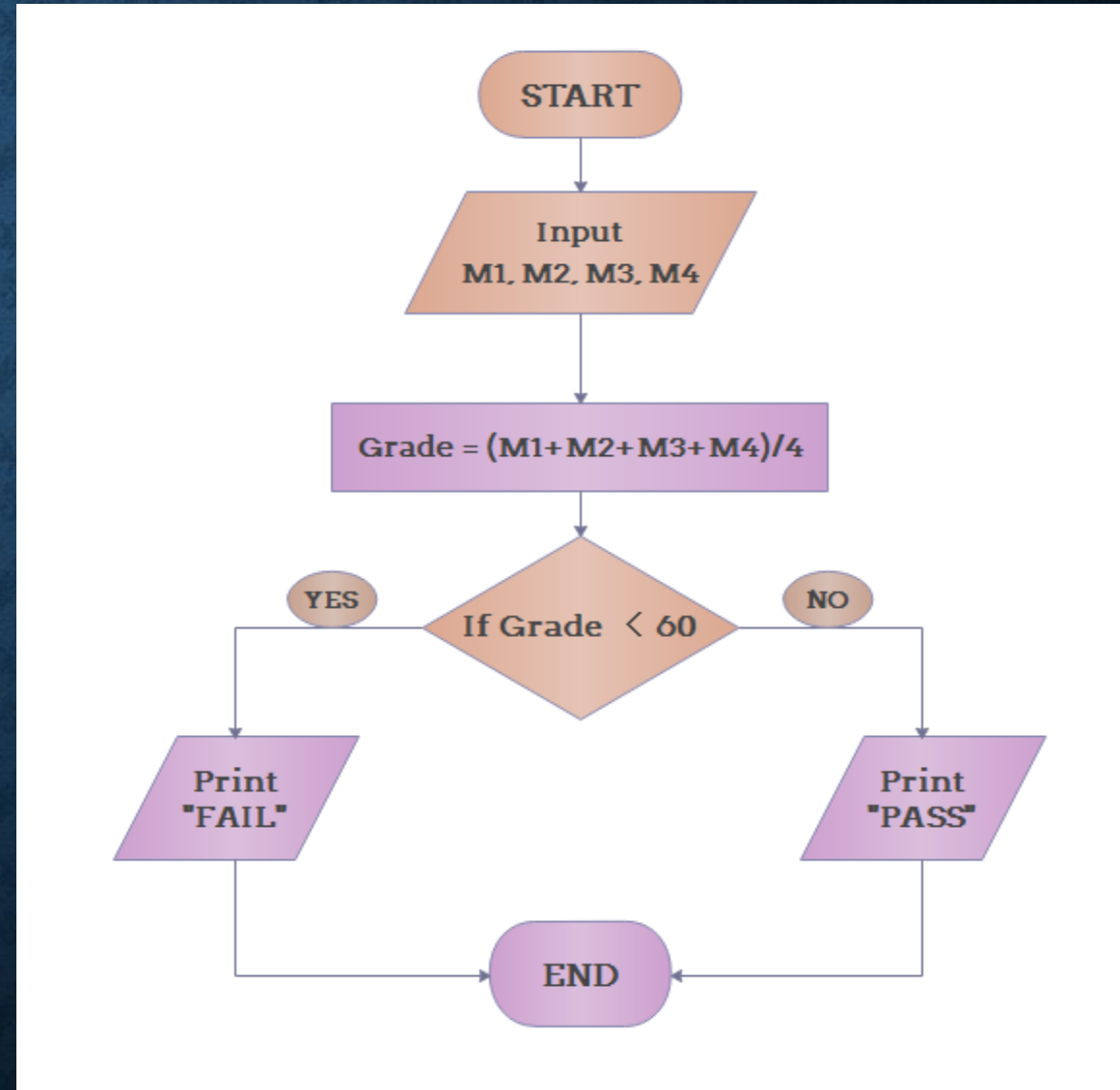
 Print "FAIL"

else

 Print "PASS"

End if

Step 4: End



Write an algorithm that accept an integer number from the user, in case of the number is Positive, check and print out whether it is Even or Odd number.

Algorithm

Step 1: Read number from user say N

Step 2: If (N > 0) then

If (N % 2 == 0) then

Print “Number is Even”

else

Print “Number is Odd”

End if

End if

Step 4: Stop

Write An Algorithm That Read Student's Mark As Integer Then Print The Equivalent Grade Depends On The Following Table:

$0 \leq \text{Mark} < 60$	$60 \leq \text{Mark} < 65$	$65 \leq \text{Mark} < 75$	$75 \leq \text{Mark} < 85$	$85 \leq \text{Mark} \leq 100$
Fail	Accept	Good	Very Good	Excellent

Step 1: Start

Step 2: Read mark

Step 3: If (mark < 60) then

Print "Fail"

Else If (mark < 65) then

Print "Accept"

Else If (mark < 75) then

Print "Good"

Else If (mark < 85) then

Print "Very Good"

Else If (mark <= 100) then

Print "Excellent"

Else

Print "Invalid Mark! Try again!"

Step 4: stop

أوجد المخطط الانسيابي (flowchart) بالإضافة إلى كود الشفرة (Pseudo code) لخوارزم يقوم بتصفير قيمتي المتغيرين X and Y (إذا كانتا قيمتهما عن $X = 0$, and $Y = 0$) إذا كانتا قيمتهما عن 100 مع طباعه عبارة X cleared Y , cleared X في حاله التصفير و طباعه قيمه X and Y

Pseudo code

Variable X, Y : integer

Begin

Read (X, Y)

If (X > 100) then

 X = 0

 Write ("cleared X ")

End if

If (Y > 100) then

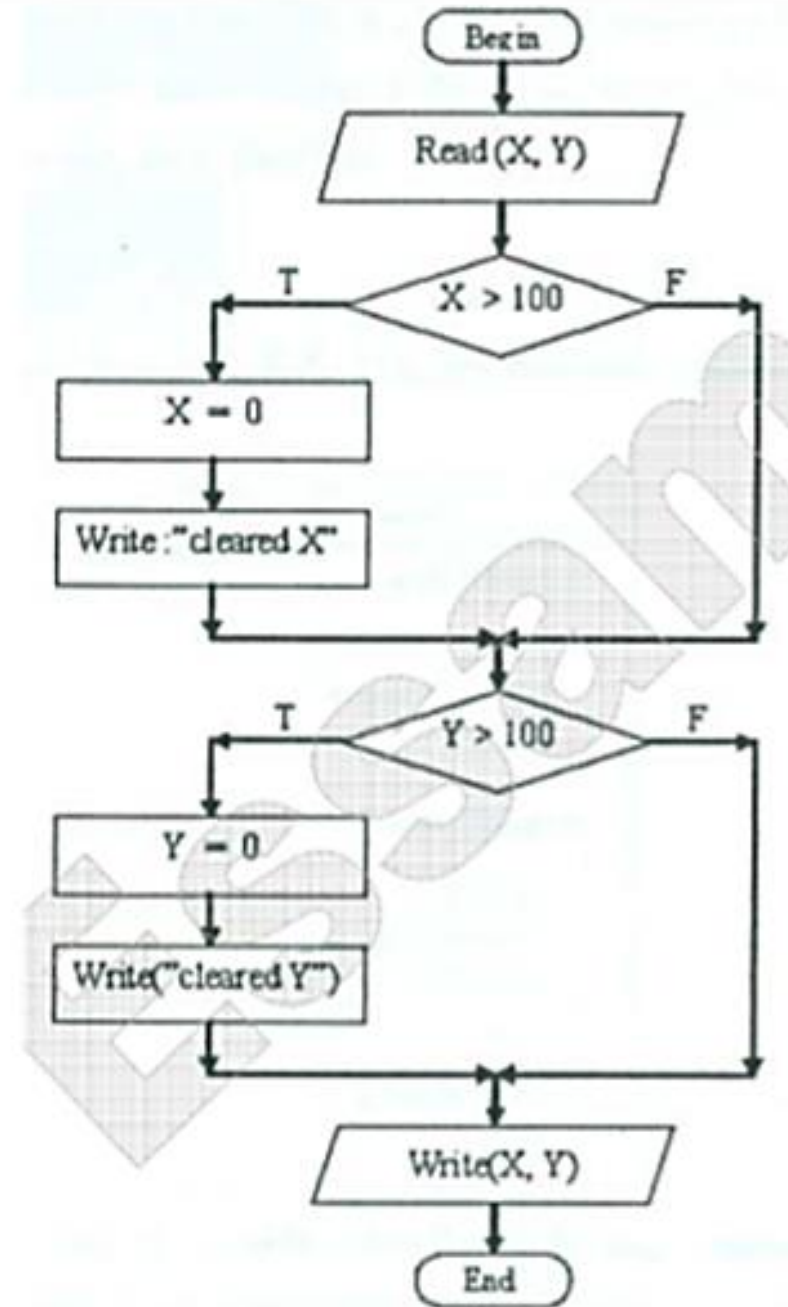
 Y = 0

 Write ("cleared Y ")

End if

Write (X, Y)

End



TASK

أوجد المخطط الاتسيلي (Flowchart) وكود الثفرة (Pseudo code) لخوارزم يقرأ أربعة أرقام (A, B, C, and D) ثم يقوم بإيجاد مجموع هذه الأرقام (Sum). إذا كان المجموع رقم زوجي فإن قيمة المتغير (Var) تساوي الجذر التربيعي للمجموع وإذا كان المجموع فردي فإن قيمة المتغير (Var) تساوي مربع المجموع. الخوارزم يقوم بطباعة المجموع (Sum) وقيمة المتغير (Var).

