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Research Paper

Remainder Prime Test

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INTRODUCTION

It is a method of identifying any number is prime or not. This method is based on prime number equation i.e. HCF [n, (n-1)!]=1; where 'n' belongs to natural number.

PROCEDURE

Steps for testing prime number:-

STEP 1: take any number (say n)
STEP 2: divide (n-1)x(n-2) by n
STEP 3: if remainder (r_1) is not zero then multiply (r_1) with (n-3)
STEP 4: divide (r_1)x(n-3) by n
STEP 5: if still remainder (r_2) is not zero then multiply (r_2) with (n-4)
STEP 6: divide (r_2)x(n-4) by n

THIS PROCESS WILL GO ON UNTILL:-

- Remainder becomes 0, or
- Nothing remains to multiply with last remainder.

➢ **Example 1 (Number =6)**
(5 x 4 = 20)÷6 Remainder *2*
(*2* x 3 = 6)÷6 Remainder 0
Hence, 6 ≠ Prime

➢ **Example 2 (Number = 7)**
(6 x 5 = 30)÷7 Remainder 2
(2 x 4 = 8) ÷7 Remainder 1
(1 x 3 = 3) ÷7 Remainder 3
(3 x 2 = 6) ÷7 Remainder 6
(6 x 1 = 6) ÷7 Remainder 6
Hence 7 = Prime

- **Example 3 (Number = 11)**

(10 x 9 = 90) ÷11 Remainder 2
(2 x 8 = 16) ÷11 Remainder 5
(5 x 7 = 35) ÷11 Remainder2
(2 x 6 = 12) ÷11 Remainder 1
(1 x 5 = 5) ÷11 Remainder 5
(5 x 4 = 20) ÷11 Remainder 9
(9 x 3 = 27) ÷11 Remainder 5
(5 x 2 = 10) ÷11 Remainder 10
(10 x 1 = 10) ÷11 Remainder 10
Hence 11 = Prime

Example 4 (Number = 8)
(7 x 6 = 42) ÷8 Remainder 2
(2 x 5 =10) ÷8 Remainder 2
(2 x 4 =8) ÷8 Remainder 0
Hence 8 ≠ Prime

CONCLUSION

After using remainder prime test**:-**

- If remainder =0, then it is not prime number.
- If remainder ≠ 0, then it is prime number.

EXCEPTION

This **remainder prime test** is not applicable on number **4** only.