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**WAP FOR POWER WITHOUT USING POW () FUNCTION**

input x, n;

x = 2, n = 3

2 \* 2 \* 2

-----  
P = P \* X;    P = 1;

-----  
#include<stdio.h>

int    main ()

{

int x, n, i , p = 1;

printf (" ENTER x AND n \n ");

scanf("%d%d", &x ,&n);

for( i = 1 ; i <= n ; i++)

{

    p = p \* x ;

}

printf(" ANS = %d \n " , p);

}

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$x = 2, n = 3, p = 1$

for  $i = 1$  to  $3$

$p = p * x$

$i = 1 \quad p = 1 * 2 = 2$

$i = 2 \quad p = 2 * 2 = 4$

$i = 3 \quad p = 4 * 2 = 8$

ANS :- 8

## **SERIES**

$1 + x^1 + x^2 + \dots + x^n$

INPUT  $X, N$

$s = s + \text{pow}(x, i);$

$s = 1;$

```
#include<stdio.h>
#include<math.h>
```

```
int main()
```

```
{
```

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```
int i , x , n , s = 1 ;  
printf(" ENTER x AND n \n ");  
scanf("%d%d" , &x , &n);  
for( i = 1 ; i <= n ; i++ )  
{  
    s = s + pow(x,i) ;  
}  
printf(" ans = %d\n" , s );  
}
```

trace:-

---

s = 1  
for i = 1 to n  
s = s + pow(x,i)  
i = 1   s = 1 + x<sup>1</sup>  
i = 2   s = 1 + x<sup>1</sup> + x<sup>2</sup>  
.  
.  
i = n   s = 1 + x<sup>1</sup> + x<sup>2</sup> + ..... + x<sup>n</sup>

---

**1A. FIND SUM OF SERIES WITHOUT USING pow() function**

$$1 + X^1 + X^2 + X^3 + ..... + X^N$$

```
#include<stdio.h>

int  main()
{
    int  i , x, n , p=1 ,s = 1 ;

    printf(" ENTER x  AND n \n ");
    scanf("%d%d", &x , &n);

    for( i = 1 ; i <= n ; i++)
    {
        p = p * x;
        s = s + p;
    }
    printf("ans = %d\n " , s );
}
```

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trace:-             $s = 1, p = 1$   
                    for  $i = 1$  to  $n$   
 $i = 1$      $p = 1 * x = x$   
                     $s = 1 + x$   
  
 $i = 2$      $p = x * x = x^2$   
                     $s = 1 + x^1 + x^2$   
  
 $i = 3$      $p = x^2 * x = x^3$   
                     $s = 1 + x^1 + x^2 + x^3$

## 1B. PRINT SERIES AND FIND SUM OF SERIES

$$1 + x^1 + x^2 + ..... + x^n$$

---

```
#include<stdio.h>
#include<math.h>

int main()
{
    int i , x , n , s = 1 ;
    printf(" ENTER x AND n \n ");
```

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```
scanf("%d%d" , &x , &n);

for( i = 1 ; i <= n ; i++ )
{
    printf(" %d ^ %d +",x, i);
    s = s + pow(x,i) ;
}
printf("\b = %d\n" , s );
}
```

---

2.  **$1 - x^1 + x^2 - ..... + x^n$**

```
#include<stdio.h>
#include<math.h>

int main()
{
    int i , x , n , p = 1 , s = 1;

    printf(" ENTER x AND n \n ");
    scanf("%d%d" , &x , &n);
```

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```
for( i = 1 ; i <= n ; i++)  
{  
    s = s + pow(-1,i) * pow(x,i) ;  
}  
printf("  ANS = %d\n" , s);  
}
```

- \_\_\_\_\_

trace:-                     $1 - x^1 + x^2 - x^3 + \dots$   
                          for i = 1 to n  
                           $s = s + \text{pow}(-1, i) * \text{pow}(x, i);$

$i = 1 \quad s = 1 - x^1$   
 $i = 2 \quad s = 1 - x^1 + x^2$   
.  
.

**3.  $1 + x^1 - x^2 + \dots$**

```
#include<stdio.h>  
#include<math.h>
```

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```
int main()
{
    int i , x , n , s = 1;
    printf(" ENTER x AND n \n ");
    scanf("%d%d" , &x , &n);
    for( i = 1 ; i <= n ; i++)
    {
        s = s + pow(-1,i+1) * pow(x,i) ;
    }
    printf("  ANS = %d\n" , s);
}
```

- \_\_\_\_\_

trace:-       $1 + x^1 - x^2 + x^3 - x^4 + \dots$   
                 $s = s + \text{pow}(-1,i+1) * \text{pow}(x,i);$   
 $i = 1 \quad s = 1 + x^1$   
 $i = 2 \quad s = 1 + x^1 - x^2$

-----  
**a) 1 , 3 , 5 ,.... odd no   (-)    $\text{pow}(-1 , i)$**

**b) 2 , 4 , 6 ,... even no   (-)    $\text{pow}(-1 , i+1)$**   
-----



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**DIFFERENCE**

int i = 3;

i++

i + 1

i = i + 1

t = i + 1

**i = 4**

t = 4

**i = 3**

**change in i**

---

**4.  $1 + (x^1)/1 + (x^2)/2 + (x^3)/3 + \dots$**

```
#include<stdio.h>
```

```
#include<math.h>
```

```
int main()
```

```
{
```

```
int i , x , n ;
```

```
float s = 1;
```

```
printf(" ENTER x AND n \n ");
```

```
scanf("%d%d" , &x , &n);
```

```
for( i = 1 ; i <= n ; i++)
```

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```
{  
    s = s + pow(x,i) / i ;  
}  
printf("  ANS = %d\n" , s);  
}
```

5.  $1 + (x^1)/2 + (x^2)/4 + (x^3)/6 + (x^4)/8 + \dots$

$$s = s + \text{pow}(x,i) / (2*i) ;$$

---

6.  $1 + (x^1)/1 + (x^2)/3 + (x^3)/5 + (x^4)/7 + \dots$

$$s = s + \text{pow}(x,i) / (2*i - 1) ;$$

---

7.  $1 + (x^1)/1 + (x^2)/5 + (x^3)/9 + (x^4)/13 + \dots$

$$s = s + \text{pow}(x,i) / (4 * i - 3) ;$$

---

$$1 \quad 5 \quad 9 \quad 13 \dots\dots \quad (\text{A.P.})$$

nth terms

$$a + (i - 1) * d$$

$$1 + (i - 1) * 4$$

$$1 + 4 * i - 4$$

$$(4 * i - 3)$$

e.g.  $i = 3$   $(4 * i - 3)$

$$(4 * 3 - 3)$$

$$= 9$$

### EXPONENTIAL SERIES

$$1 + (x^1)/1! + (x^2)/2! + (x^3)/3! + (x^4)/4! + \dots$$

**f = f \* i; factorial**

**s = s + pow (x,i) / f ;**

---

```
#include<stdio.h>
```

```
#include<math.h>
```

```
int main()
```

```
{
```

```
    int x , n , i , f = 1;
```

```
    float s = 1;
```

```
    printf(" ENTER x AND n \n ");
```

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```
scanf("%d%d",&x,&n);  
for( i = 1 ; i <= n ; i++)  
{  
    f = f * i ; // fact.  
    s = s + pow(x,i)/ f ;  
}  
printf("ANS = %f\n" , s);  
}
```

---

$f = 1, s = 1$

for  $i = 1$  to  $n$

$i = 1 \quad f = 1 * 1 = 1 = 1!$

$s = 1 + (x^1)/1!$

$i = 2 \quad f = 1 * 2 = 2 = 2!$

$s = 1 + (x^1)/1! + (x^2)/2!$

$i = 3 \quad f = 2 * 3 = 6 = 3!$

$s = 1 + (x^1)/1! + (x^2)/2! + (x^3)/3!$

---

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**9.  $1 - (x^1)/1! + (x^2)/2! - (x^3)/3! +$**

```
#include<stdio.h>
#include<math.h>
int main()
{
    int i , n ,x, f = 1;
    float s = 1 ;
    printf(" ENTER x AND n \n ");
    scanf("%d%d" , &x , &n);
    for( i = 1 ; i <= n ; i++ )
    {
        f = f * i ; // factorial
        s = s + pow(-1,i)* pow(x,i)/f ;
    }
    printf("ans = %f\n" , s );
}
```

trace:-

	f = 1 , s = 1
	for i = 1 to n
i = 1	f = 1 * 1 = 1
	s = 1 - x <sup>1</sup> / 1

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**1. POWER             $P = P * X ; P = 1$**

**2.     $1 + X^1 + X^2 + X^3 + ..... + X^N$**

**$S = S + POW(X,I) ;$**

**3.     $1 - x^1 + x^2 - x^3 + .....$**

**$S = S + POW(-1,I) * POW(X,I);$**

**4.     $1 + x^1 - x^2 + x^3 - .....$**

**$S = S + POW(-1,I+1) * POW(X,I);$**

**5.     $1 + (x^1)/1 + (x^2)/2 + .....$**

**$S = S + POW(X,I) / I ;$**

**6. EXPONENTIAL SERIES**

**$1 + (x^1)/1! + (x^2)/2! + (x^3)/3! + .....$**

**$F = F * I;$**

**$S = S + POW(X,I)/F ;$**

**7.     $1 - (x^1)/1! + (x^2)/2! - (x^3)/3! + .....$**

**$F = F * I;$**

**$S = S + POW(-1,I) * POW(X,I)/F ;$**