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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);
}
```

x = 2 , n = 3 , p = 1

for i = 1 to 3

$$p = p * x$$

$$i = 1 \quad p \cancel{= 1 * 2} = 2$$

$$i = 2 \quad p \cancel{= 2 * 2} = 4$$

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

ANS :- 8

SERIES

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

INPUT X,N

s = s + 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^1
i = 2 s = 1 + x^1 + x^2
.
.
i = n s = 1 + x^1 + x^2 + + x^n

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

$$1 + X^1 + X^2 + X^3 + \dots + X^N$$

```
#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
 $i = 1 \quad p = 1 * x = x$
 $s = 1 + x$

$i = 2 \quad p = x * x = x^2$
 $s = 1+x^1 + x^2$

$i = 3 \quad p = x^2 * x = x^3$
 $s = 1+x^1+x^2 +x^3$

1B. PRINT SERIES AND FIND SUM OF SERIES

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

```
#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

$s = s + pow(-1, i) * pow(x, i);$

$i = 1 \quad s = 1 - x^1$

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

.

.

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:- $1 + x^1 - x^2 + x^3 - x^4 + \dots$

$s = s + pow(-1,i+1) * pow(x,i);$

i = 1 s = 1 + x^1

i = 2 s = 1 + $x^1 - x^2$

- a) 1 , 3 , 5 ,.... odd no (-) pow(-1 ,i)**
- b) 2 , 4 , 6 ,... even no (-) 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++)
```

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

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

$s = s + pow(x,i) / (2*i) ;$

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

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

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

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

1 5 9 13 (A.P.)

nth terms

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

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

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$$\begin{aligned} & 1 + 4 * i - 4 \\ & (4 * i - 3) \\ \text{e.g. } & i = 3 \quad (4 * i - 3) \\ & (4 * 3 - 3) \\ & = 9 \end{aligned}$$

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^1 / 1
```

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

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

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

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

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

4. $1 + x^1 - x^2 + x^3 - \dots$

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

5. $1 + (x^1)/1 + (x^2)/2 + \dots$

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

6. EXPONENTIAL SERIES

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

$F = F * I;$

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

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

$F = F * I;$

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