**clear**

**clc**

**clf**

**k1=input("Order of function=")**

**n=0**

**while n<k1**

**x=poly(0,'x')**

**a=factorial(n)**

**b=1/((2.^n)\*a)**

**d=(x^2-1)^n**

**if(n>0) then**

**for i=1:n**

**z=derivat(d)**

**d=z**

**end**

**end**

**p=d\*b**

**n=n+1**

**end**

**disp("P("+string(n-1)+")=")**

**disp(p)**

**k2=input("Order of function=")**

**n=0**

**while n<k2**

**x=poly(0,'x')**

**a=factorial(n)**

**b=1/((2.^n)\*a)**

**d=(x^2-1)^n**

**if(n>0) then**

**for i=1:n**

**z=derivat(d)**

**d=z**

**end**

**end**

**q=d\*b**

**n=n+1**

**end**

**disp("P("+string(n-1)+")=")**

**disp(q)**

**y=p\*q**

**m=pol2str(y)**

**x=-10:0.1:10**

**i=integrate(m,'x',-1,1,0.0001)**

**disp("Integral="+string(i))**

**p=1**

**q=poly(0,'x')**

**disp(q)**

**disp("Values of P(2) to P(10) are as follows:-")**

**for n=2:10**

**x=poly(0,'x')**

**r=((2\*(n-1)+1)\*x\*q - (n-1)\*p)/(n)**

**disp(r)**

**p=q**

**q=r**

**end**

**Order of function=2**

**P(1)=**

**x**

**Order of function=2**

**P(1)=**

**x**

**Integral=0.6666667**

**x**

**Values of P(2) to P(10) are as follows:-**

**2**

**- 0.5 + 1.5x**

**3**

**- 1.5x + 2.5x**

**2 4**

**0.375 - 3.75x + 4.375x**

**3 5**

**1.875x - 8.75x + 7.875x**

**2 4 6**

**- 0.3125 + 6.5625x - 19.6875x + 14.4375x**

**3 5 7**

**- 2.1875x + 19.6875x - 43.3125x + 26.8125x**

**2 4 6 8**

**0.2734375 - 9.84375x + 54.140625x - 93.84375x + 50.273438x**

**3 5 7 9**

**2.4609375x - 36.09375x + 140.76562x - 201.09375x + 94.960938x**

**2 4 6 8 10**

**- 0.2460938 + 13.535156x - 117.30469x + 351.91406x - 427.32422x + 180.42578x**