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Course: B.Sc(H) Physics Sem-5

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Aim:Use cosole represetatio for generating two different Legedre’s polyomials of first kid ad check for their orthogonality, while order of the corresponding polyomials.

Source Code:

clear

clc

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))

Output:

Order of function=3

P(2)=

-0.5 +1.5x ^2

Order of function=4

P(3)=

-1.5x +2.5x ^3

Integral=0

Order of function=3

P(2)=

-0.5 +1.5x^2

Order of function=3

P(2)=

-0.5 +1.5x^2

Integral=0.4