

```

function question1
    f=@(t) exp(-t.*t)*2/sqrt(pi);
        x=-5:.01:5;
    for i=1:length(x)
        myerf(i)=quad( f,0,x(i));
    end
    figure(1);
    plot(x,myerf);

    nig=diff(myerf(i))/.01;
    nignig=diff(nig)/.01;
    [~,b]=min(nignig);
    disp(x(b));
end

```

```

function question3(f)
    p=-1:.1:1;
    for i=1:length(p)
        [~,a(i)]=fminsearch(@(x) -p(i)*x+f(x),0);
    end
    figure(3);
    plot(a);
end

```

```

function question4
    t=[1 3 4 7 8 10]';
    p=[2.1 4.6 5.4 6.1 6.4 6.6]';
    solution=pinv([p , -t])*(p.*t);
    x=0:.1:12;
    figure(4);
    plot(x,solution(2)*x./(solution(1)+x));
    hold on;
    plot(t,p,'*');
    hold off;
end

```

```

function output=question5(n,x)
    m=round(x*(1:n));
    [~,k]=min(abs(m./(1:n)-x));
    output=[m(k) k];
end

```

```

f:=2*exp(-t^2)/sqrt(PI);

g:=int(f,t=0..x);

plot(g,x=-5..5)

f:=t->2*exp(-t^2)/sqrt(PI);

g:=x->int(f(t),t=0..x);

extrema:=numeric::solve(g''(x)=0,x=-10..10,AllRealRoots)

IsItMin:=[g'''(extrema[1]),g'''(extrema[2])]

bool(IsItMin[1]>0)

reset();
question2:= proc(p)
begin;
M:=2^p-1;
SBefore:=4;
for i from 2 to p-1 do
SAfter:=SBefore^2-2;
SBefore:=SAfter;
end_for;
if bool(floor(SAfter/M)=SAfter/M ) then
return(1);
else
return(0);
end_if
end_proc;

reset();
errorq:=infinity:
m:=infinity:
k:=infinity:
question5:=proc(x,n)
begin;
for i from 1 to n do
for j from 1 to 2 do
temp_k:=i*(2*j-3);
temp_m:=round(x*i*(2*j-3));
temp_error:=abs(temp_m/(i*(2*j-3))-x);
if errorq > temp_error then
k:=temp_k;
errorq:=temp_error;
m:=temp_m;
end_if;
end_for;
end_for;
return([m ,k]);
end_proc:
question5(PI,7);

```

