I am going to only buy 10a as I have 3 grace days left.

A)
let w(t)=t^2+b*t+c
integral of w(t) from 3 to 4 is (6*c+21*b+74)/6
integral of t*w(t) from 3 to 4 is (42*c+148*b+525)/12

since both results have to be 0
(6*c+21*b+74)/6=0;
(42*c+148*b+525)/12=0;

b=-7 and c=73/6
therefore w(t)=t^2-7*t+73/6 = (t-(7/2+1/(2*sqrt(3))))*(t-(7/2-1/(2*sqrt(3))))
and the root of this function is
t1= 7/2-1/(2*sqrt(3))
t2= 7/2+1/(2*sqrt(3))

B)

I'll use Lagrange polynomial interpolation to find w1 and w2.
t1~=3.2113
t2~=3.7887
t3=7/2, w(t3)= -1/12
(using t1 and t3)
p1 = (x-3.2113)/(3.5-3.2133)*(-1/12) = -0.290664*(-3.2113 + x)
(using t2 and t3)
p2 = (x-3.7887)/(3.5-3.7887)*(-1/12) = 0.28865*(-3.7887 + x)
integral(p1)[3,4] = -0.0839146968 ~=0 + w2*p1(t2) → **w2 = 0.5**
integral(p2)[3,4]= -0.083333255 ~=w1*p2(t1) + 0 → **w1 = 0.5**

so w1 = 0.5, w2 = 0.5, t1=3.2113,t2=3.7887
C)
f(x)=x^3+1
integral[3,4](f(x))=((3.2113)^3+1+(3.7887)^3+1)*0.5=44.75
we got an exact answer using the above method
D)
Using above method
integral[3,4](e^x)~= e^(3.2113)*0.5+e^(3.7887)*0.5=34.5051
integral[3,4](1/(x−2))~=(1/(3.2113−2)+1/(3.7887−2))*0.5=0.6923
integral[3,4](cos(x))~=(cos(3.2113)+cos(3.7887))*0.5=-0.8977

Using composite Midpoint rule
```
function res=MidPointRule(f,a,b)
   res=f((a+b)/2)*(b-a);
end
```
f=@(x)exp(x);
t=linspace(3,4,3);
for i=1:2
	res=res+MidPointRule(f,t(i),t(i+1));

end
res =**34.155710958627921**

f=@(x)1/(x−2);
res= **0.685714285714286**
f=@(x)cos(x);
res=**-0.907344516710054**

Lastly using Simpson
```
function res=Simpson_rule(f,a,b)
   res=(f(a)+4*f((a+b)/2)+f(b))*(b-a)/6;
end
```
f=@(x)exp(x);
Simpson_rule(f,3,4) = **34.524249131850191**
f=@(x)1/(x-2);
res = **0.694444444444444**
f=@(x)cos(x);
res = **-0.898243811104540**

Using antiderivatives for integral(same order as above)=
34.51261310995657
0.6931471805599453
0.8979225033677955
For all three functions, the output from Gaußian rules is closest to the actual value therefore error is the smallest.