3rd Order Heun's Method

```
function [x1next,x2next,x3next,x4next] =
 HeunsThirdOrder(x1,x2,x3,x4,h,f,g,m,n)

b1=1/4;b2=0;b3=3/4;
a21=1/3;a31=0;a32=2/3;

k11 = f(x2);
k21 = g(x1,x3,x4);
k31 = m(x4);
k41 = n(x1,x2,x3);

k12 = f(x2+h*a21*k21);
k22 = g(x1+h*a21*k11,x3+h*a21*k31,x4+h*a21*k41);
k32 = m(x4+h*a21*k41);
k42 = n(x1+h*a21*k11,x2+h*a21*k21,x3+h*a21*k31);

k13 = f(x2+h*a31*k21+h*a32*k22);
k23 =
 g(x1+h*a31*k11+h*a32*k12,x3+h*a31*k31+h*a32*k32,x4+h*a31*k41+h*a32*k42);
k33 = m(x4+h*a31*k41+h*a32*k42);
k43 =
 n(x1+h*a31*k11+h*a32*k12,x2+h*a31*k21+h*a32*k22,x3+h*a31*k31+h*a32*k32);

x1next=x1 + h*(b1*k11 + b2*k12 + b3*k13);
x2next=x2 + h*(b1*k21 + b2*k22 + b3*k23);
x3next=x3 + h*(b1*k31 + b2*k32 + b3*k33);
x4next=x4 + h*(b1*k41 + b2*k42 + b3*k43);
```

```
Not enough input arguments.

Error in HeunsThirdOrder (line 7)
k11 = f(x2);
```

Published with MATLAB® R2020b