

---

```
function secant

% Solves  $f(x) = 0$  using the secant method

% Input:
% xa = first starting point
% xb = second starting point
% tol = tolerance for stopping
% f(x) This is at end of code
u=1.8*10(-5);
p=1.2;
g=9.8;
m=0.14;
pi=3.1415926;
d=0.075;
a=8*p*m*g/(pi*u2)

xa=a/25;
xb=a/24;
tol=10(-5);

% exact solution
xe=1.767129*105;

fa=f(xa);
fb=f(xb);
err=3*tol;
it=0;
while err>tol
    xc=xb-fb*(xb-xa)/(fb-fa);
    err=abs(xc-xb);
    xa=xb; fa=fb;
    xb=xc; fb=f(xb);
    it=it+1; iteration(it)=it; error(it)=abs(xe-xc);
    fprintf('\n %d Computed Solution = %13.8e Error =
    %5.2e',it,xb,error(it))
    %pause
end

velocity=xe*u/(p*d)
fprintf('\n\n')

function g=f(x)
u=1.8*10(-5);
p=1.2;
g=9.8;
m=0.14;
pi=3.1415926;
a=8*p*m*g/(pi*u2);
g=2*x2/5+6*x2/(1+sqrt(x))+24*x-a;
```

---

---

a =

1.2940e+10

1	Computed Solution = 2.64036283e+08	Error = 2.64e+08
2	Computed Solution = 1.77207736e+08	Error = 1.77e+08
3	Computed Solution = 1.06013152e+08	Error = 1.06e+08
4	Computed Solution = 6.63108185e+07	Error = 6.61e+07
5	Computed Solution = 4.07782524e+07	Error = 4.06e+07
6	Computed Solution = 2.52380277e+07	Error = 2.51e+07
7	Computed Solution = 1.55800664e+07	Error = 1.54e+07
8	Computed Solution = 9.62620577e+06	Error = 9.45e+06
9	Computed Solution = 5.94512166e+06	Error = 5.77e+06
10	Computed Solution = 3.67252269e+06	Error = 3.50e+06
11	Computed Solution = 2.26971634e+06	Error = 2.09e+06
12	Computed Solution = 1.40519916e+06	Error = 1.23e+06
13	Computed Solution = 8.74273963e+05	Error = 6.98e+05
14	Computed Solution = 5.51151830e+05	Error = 3.74e+05
15	Computed Solution = 3.58977728e+05	Error = 1.82e+05
16	Computed Solution = 2.51169400e+05	Error = 7.45e+04
17	Computed Solution = 1.98751068e+05	Error = 2.20e+04
18	Computed Solution = 1.80319154e+05	Error = 3.61e+03
19	Computed Solution = 1.76920004e+05	Error = 2.07e+02
20	Computed Solution = 1.76715047e+05	Error = 2.15e+00
21	Computed Solution = 1.76712986e+05	Error = 8.60e-02
22	Computed Solution = 1.76712985e+05	Error = 8.48e-02
23	Computed Solution = 1.76712985e+05	Error = 8.48e-02

velocity =

35.3426

*Published with MATLAB® R2017a*