

Lampiran 2. *Source Code* MATLAB untuk Pencarian Akar Persamaan Nonlinear

$f(x)$	<pre>function ff=f(x) %ff=cos(x)-0.5; %ff=sin(x); %ff=x^5-5*x^3+2*x; %ff=x^6-3*x^4+7*x^2-20; %ff=sin(x)-cos(x); %ff=tan(x)-x;</pre>
$f'(x)$	<pre>function ff=faksen(x) %ff=-sin(x); %ff=cos(x); %ff=5*x^4-15*x^2+2; %ff=6*x^5-12*x^3+14*x; %ff=cos(x)+sin(x); %ff=(sec(x))^2-1;</pre>
<p>Newton-Raphson</p>	<pre>clear all; clc; fprintf('Program Newton-Raphson\n'); x(1)=input('inputkan x:'); %nilai awal eps=10^(-15); x(2)=x(1)-f(x(1))/faksen(x(1)); err=abs(x(2)-x(1)); i=1; fprintf('i x(i) x(i+1) err \n'); fprintf('%d %4.15f %4.15f %4.15f\n', i,x(i),x(i+1),err) while (err>eps) i=i+1; x(i+1)=x(i)-f(x(i))/faksen(x(i)); err=abs(x(i+1)-x(i)); %nilai kesalahan per-iterasi</pre>

	<pre> fprintf('%d %4.15f %4.15f %4.15f\n ', i,x(i),x(i+1),err) end; </pre>
Basu	<pre> clear all; clc; fprintf ('\n\nProgram Basu\n'); x(1)=input('inputkan x:'); %nilai awal eps=10^(-15); y(1)=x(1)-(2*f(x(1)))/(3*faksen(x(1))); x(2)=x(1)-((9*(faksen(y(1))^2))- 2*faksen(y(1))*faksen(x(1))+(9*(faksen(x(1))^2)))/... ((12*(faksen(y(1))^2))+4*faksen(y(1))*f aksen(x(1)))*(f(x(1))/faksen(x(1))); err=abs(x(2)-x(1)); i=1; fprintf('i x(i) x(i+1) err \n'); fprintf('%d %4.15f %4.15f\n ', i,x(i),x(i+1),err) while (err>eps) i=i+1; y(i)=x(i)- (2*f(x(i)))/(3*faksen(x(i))); x(i+1)=x(i)-((9*(faksen(y(i))^2))- 2*faksen(y(i))*faksen(x(i))+(9*(faksen(x(i))^2)))/... ((12*(faksen(y(i))^2))+4*faksen(y(i))*f aksen(x(i)))*(f(x(i))/faksen(x(i))); </pre>

	<pre> err=abs(x(i+1)-x(i)); %nilai kesalahan per-iterasi fprintf('%d %4.15f %4.15f %4.15f\n ', i,x(i),x(i+1),err) end; </pre>
Orde-6	<pre> clear all; clc; fprintf ('Program Orde-6\n'); x(1)=input('inputkan x:'); %nilai awal eps=10^(-15); y(1)=x(1)-(2*f(x(1)))/(3*faksen(x(1))); z(1)=x(1)-((9*(faksen(y(1))^2))- 2*faksen(y(1))*faksen(x(1))+(9*(faksen(x(1))^2)))/... ((12*(faksen(y(1))^2))+4*faksen(y(1))*f aksen(x(1)))*(f(x(1))/faksen(x(1))); x(2)=z(1)-(f(z(1))*(z(1)- y(1)))/((2*f(z(1))-2*f(y(1))- faksen(y(1))*(z(1)-y(1)))); err=abs(x(2)-x(1)); i=1; fprintf('i x(i) x(i+1) err \n'); fprintf('%d %4.15f %4.15f %4.15f\n ', i,x(i),x(i+1),err) while (err>eps) </pre>

```

if f(x(i))<eps
    i=i+1;
    x(i+1)=x(i);
    err=abs(x(i+1)-x(i)); %nilai
kesalahan per-iterasi

fprintf('%d           %4.15f
        %4.15f           %4.15f\n
', i,x(i),x(i+1),err)
    break
end;

i=i+1;
y(i)=x(i)-
(2*f(x(i)))/(3*faksen(x(i)));

z(i)=x(i)-((9*(faksen(y(i))^2))-
2*faksen(y(i))*faksen(x(i))+(9*(faksen(x(i))^2)))/...

((12*(faksen(y(i))^2))+4*faksen(y(i))*f
aksen(x(i)))*(f(x(i))/faksen(x(i)));

x(i+1)=z(i)-(f(z(i))*(z(i)-
y(i)))/((2*f(z(i))-2*f(y(i))-
faksen(y(i))*(z(i)-y(i))));

err=abs(x(i+1)-x(i)); %nilai kesalahan
per-iterasi

fprintf('%d           %4.15f
        %4.15f           %4.15f\n
', i,x(i),x(i+1),err)

end;

```