Reference Solution to "Computation of the Feigenbaum Delta (audit)"

```
num_doublings=11; num_newton=10;

n=0; m(1+n)=2;       %analytic
n=1; m(1+n)=1+sqrt(5); %analytic
delta=zeros(1,11); delta(1)=5;

for n=2:num_doublings
  N=2^n;
  mu=m(n)+(m(n)-m(n-1))/delta(n-1); %initial guess for m(1+n)
  for i=1:num_newton %Newton's iteration
    x=1/2; y=0;
    for j=1:N
      y=x*(1-x) + mu*y*(1-2*x);
      x=mu*x*(1-x);
    end
    Delta = (x-1/2)/y; %Newton's method
    mu = mu - Delta;
  end
  m(1+n)=mu;
  delta(n)=(m(n)-m(n-1))/(m(n+1)-m(n));
end
% Output your results
fprintf('n      delta(n)\n');
for n=1:num_doublings
  fprintf('%2g %18.15f\n',n,delta(n));
end
```

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