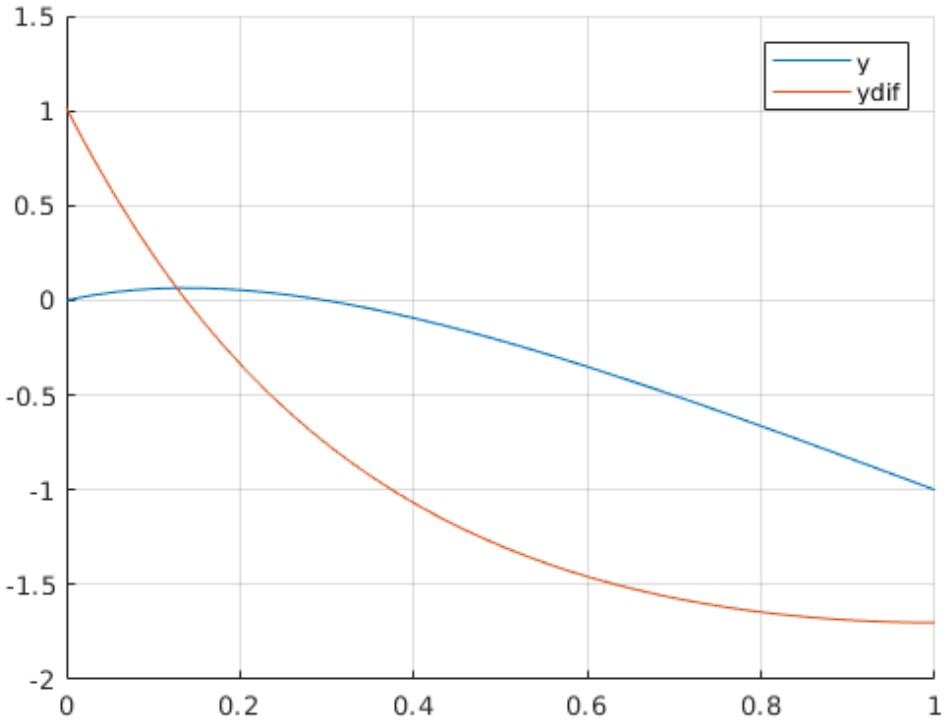
```
function shooting
    clc

    xstart = 0;
    xstop = 2;
    h = 0.1;
    t1 = 1;
    t2 = 2;
    t = ridder(@residual,t1,t2);
    [xsol,ysol] = ode45(@deqn,[0 1], inCond(t));
    sol = [xsol ysol];
    hold on;
    plot(xsol,ysol(:,1))
    plot(xsol,ysol(:,2))
    legend('y','ydif');
    grid on;
end

function F = deqn(x,y)
    F = [y(2); 9*(y(1)-1+2*x)];
end

function y = inCond(t)
 y = [0; t];
end

function r = residual(t)
 [xsol,ysol] = ode45(@deqn,[0 1], inCond(t));
    r = ysol(length(ysol)) + 1;
end

function root = ridder(func, x1, x2, tol)
    if nargin < 4
        tol = 1e-10;
    end

    f1 = feval(func,x1);
    if f1 == 0
        root = x1;
        return;
    end

    f2 = feval(func,x2);
    if f2 == 0
        root = x2;
        return;
    end

    if f1*f2 > 0
        error('Root not bracketed in (x1,x2)');
        abort;
    end
```

```
    xo = 0;

    for i = 1:100
       x3 = (x1+x2)/2;
       f3 = feval(func, x3);

       if f3 == 0
           root = x3;
           return;
       end

       s = sqrt(f3^2 - f1*f2);

       if s <= 0
           root = NaN;
           return;
       end

       dx = (x3-x1)*f3/s;
       if f1 - f2 < 0
           dx = -dx;
       end

       x4 = x3 +dx; f4 = feval(func, x4);

       if i > 1
           if abs(x4-xo) < tol*max(abs(x4),1)
               root = x4;
               return;
           end
       end
       xo = x4;
       if f1*f4 < 0
           x2 = x4; f2 = f4;
       else
           x1 = x4; f1 = f4;
       end
    end

    root = NaN;
end
```



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