
Dr. Leon VanDommelen, Exam 1, 10/04/18, Question 3

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IMPORTANT:

- 1) Do not change **anything** in this header! Put the solution to the question completely at the end of the file.
- 2) Since the solution requires a custom function ODE, put a

```
%% Additional m-File: ODE.m  
%  
% <include>ODE.m</include>
```

block behind your main solution. (Copy the above three lines and paste them completely at the end of this file, behind a blank line. For each line, get rid of the first percent and the two spaces behind it.)

Initialize

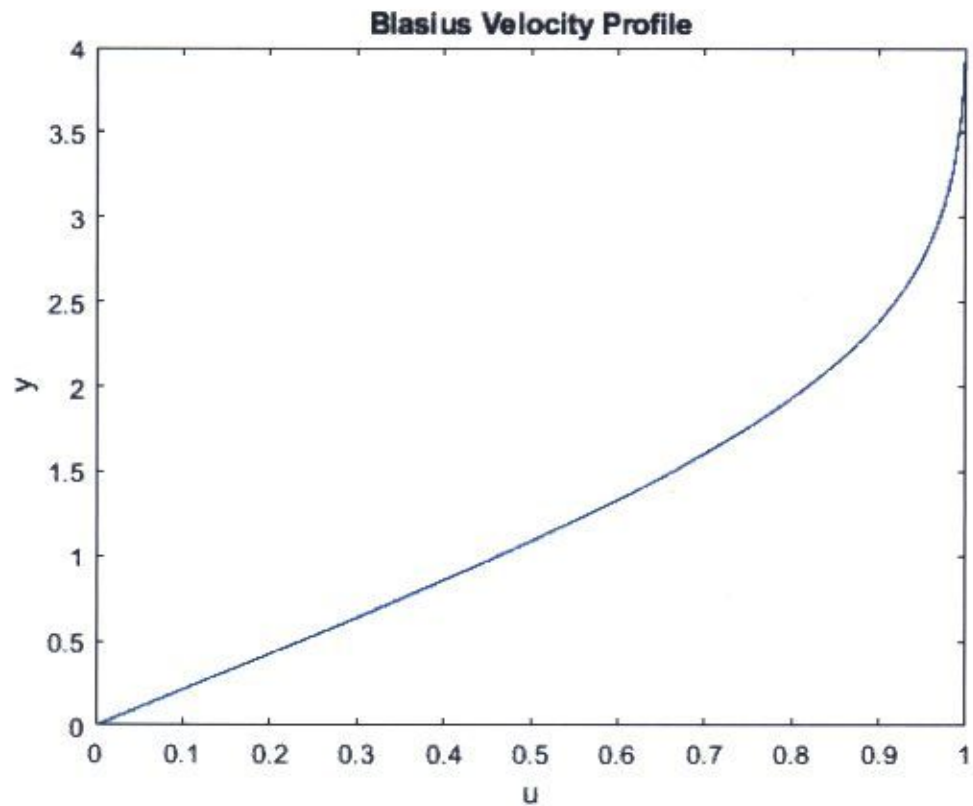
```
format compact  
more off
```

My Solution:

```
[yValues unknownsValues] = ...  
    ode45('ODE', linspace(0,4,100), [0 0 .47]');  
uValues=unknownsValues(:,2);  
plot(uValues,yValues,'b')  
title('Blasius Velocity Profile')  
xlabel('u')  
ylabel('y')
```

① create function ODE
② ode45 call, generic
③ put in initial conditions
④ put in t-range

⑤ take u out of unknowns values
④ plot axes as requested
③ title, xlabel, ylabel



Additional m-File: ODE.m

```
function unknownsDerivatives = ODE(y,unknowns)

% take the unknowns out of the vector for readability
p=unknowns(1);
u=unknowns(2);
o=unknowns(3);

% derivatives of the unknowns
dpdy=u;
dudy=o;
dody=-p*o;

% return the derivatives as a *column* vector
unknownsDerivatives=[dpdy dudy dody]';

end
```

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