

---

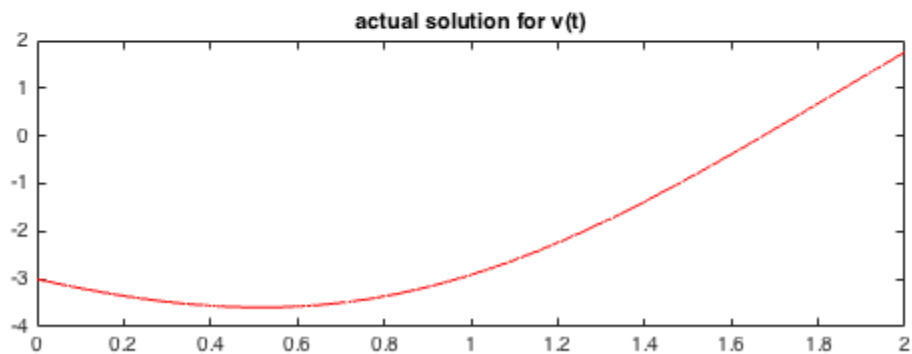
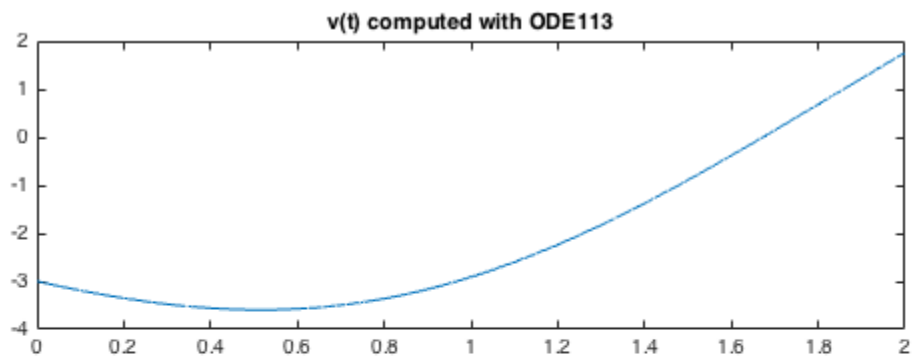
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```
% odesampletest
% test odesample for various tolerances
%
% From http://www.amath.washington.edu/~rjl/fdmbook/chapter5 (2007)
```

## Part A

```
ODE113 = 'ode113';
tol = 1e-3;
[error] = Problem5_8_a(tol, 'on', ODE113);
```



## Part C

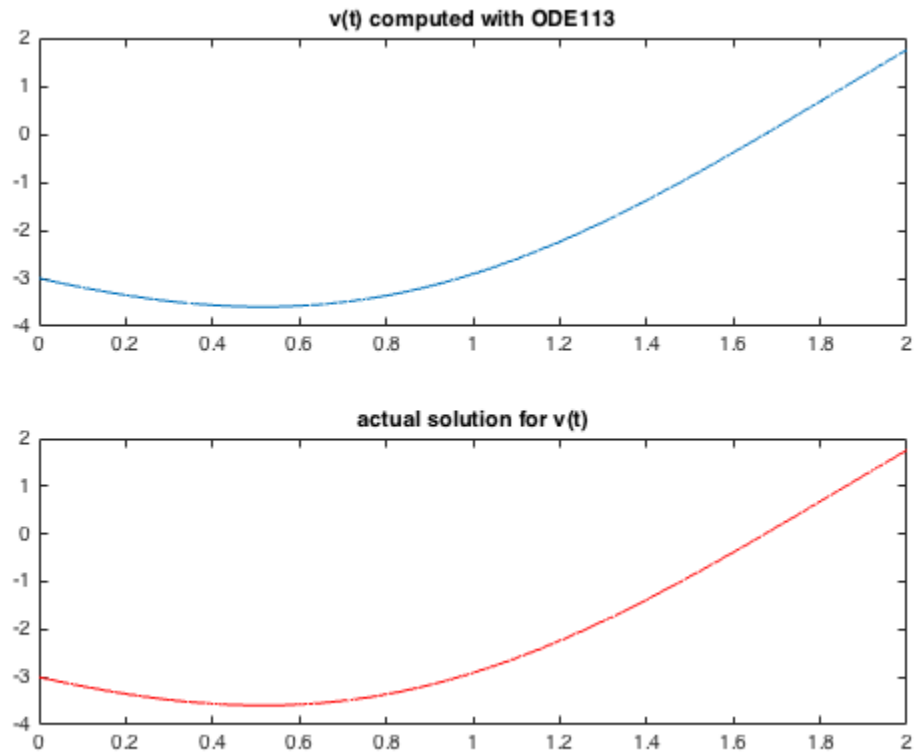
```
close all
```

---

```

ODE113 = 'ode113';
tol = 1e-3;
err = Problem5_8_a(tol, 'on', ODE113);

```



## Part D

```

clear all
ODE45 = 'ode45';
ODE113 = 'ode113';
global fcnevals
fprintf('Results or %s Solver', ODE113)
disp(' ')
disp('      tol      &    max error  &  f evaluations \\\')
disp(' ')
for tol = logspace(-1,-13,13)
    %odesample(tol)
    err = Problem5_8_a(tol, 'off', ODE113);
    disp(sprintf(' %12.3e & %12.3e & %7i \\\\' ,tol, err,fcnevals))
end
disp(' ')

```

*Results or ode113 Solver*

<i>tol</i>	<i>&amp;</i>	<i>max error</i>	<i>&amp;</i>	<i>f evaluations</i>	<i>\\</i>
<i>1.000e-01</i>	<i>&amp;</i>	<i>6.271e-04</i>	<i>&amp;</i>	<i>27</i>	<i>\\</i>
<i>1.000e-02</i>	<i>&amp;</i>	<i>4.875e-04</i>	<i>&amp;</i>	<i>29</i>	<i>\\</i>

---

1.000e-03	&	6.338e-04	&	33	\\
1.000e-04	&	1.196e-04	&	41	\\
1.000e-05	&	1.996e-05	&	47	\\
1.000e-06	&	7.727e-07	&	63	\\
1.000e-07	&	2.087e-07	&	73	\\
1.000e-08	&	1.283e-08	&	87	\\
1.000e-09	&	4.231e-10	&	115	\\
1.000e-10	&	6.669e-11	&	131	\\
1.000e-11	&	6.143e-12	&	147	\\
1.000e-12	&	1.364e-12	&	157	\\
1.000e-13	&	5.418e-14	&	177	\\

## Part E

```
fprintf('Results or %s Solver', ODE45)
disp(' ')
disp('      tol      &      max error & f evaluations \\\')
disp(' ')
for tol = logspace(-1,-13,13)
    %odesample(tol)
    err = Problem5_8_a(tol, 'off', ODE45);
    disp(sprintf(' %12.3e & %12.3e & %7i \\\\' ,tol, err,fcnevals))
end
```

```
Results or ode45 Solver
      tol      &      max error & f evaluations \\\'

1.000e-01 & 9.882e-06 & 67 \\
1.000e-02 & 1.024e-05 & 67 \\
1.000e-03 & 1.044e-05 & 67 \\
1.000e-04 & 9.925e-06 & 67 \\
1.000e-05 & 5.394e-06 & 85 \\
1.000e-06 & 5.069e-07 & 127 \\
1.000e-07 & 4.763e-08 & 199 \\
1.000e-08 & 4.573e-09 & 313 \\
1.000e-09 & 4.398e-10 & 493 \\
1.000e-10 & 4.359e-11 & 781 \\
1.000e-11 & 4.382e-12 & 1237 \\
1.000e-12 & 4.325e-13 & 1951 \\
1.000e-13 & 4.396e-14 & 3091 \\
```

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