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Problem 2a, solve given IVP using Euler's method and compare to exact soln

```
clear all;clc
t = 0:.1:1;
h = .1;
y(1) = 2;
f = @(t,y) -5*y + 6*exp(t);
for i = 1:length(t) - 1
    y(i + 1) = y(i) + h*f(t(i),y(i));
end
% compare estimated values to actual values
y
exact = exp(-5.*t) + exp(t)
error = abs(exact - y)
```

```
y =

  Columns 1 through 7

    2.0000    1.6000    1.4631    1.4644    1.5421    1.6662    1.8223

  Columns 8 through 11

    2.0044    2.2105    2.4406    2.6960


exact =

  Columns 1 through 7

    2.0000    1.7117    1.5893    1.5730    1.6272    1.7308    1.8719

  Columns 8 through 11

    2.0440    2.2439    2.4707    2.7250


error =

  Columns 1 through 7

         0    0.1117    0.1262    0.1086    0.0850    0.0647    0.0496
```

Columns 8 through 11

0.0395   0.0334   0.0302   0.0290

Problem 2b

```
clear all;clc
t = 0:0.1:1
h = 0.1
y(1) = exp(1);
f = @(t,y) -10*y + 10*t + 1;
for i = 1:length(t) - 1
    y(i+1) = y(i) + h*f(t(i),y(i));
end
y
exact = exp(-10.*t + 1) + t
error = abs(exact - y)
```

t =

  Columns 1 through 7

        0   0.1000   0.2000   0.3000   0.4000   0.5000   0.6000

  Columns 8 through 11

    0.7000   0.8000   0.9000   1.0000

h =

    0.1000

y =

  Columns 1 through 7

    2.7183   0.1000   0.2000   0.3000   0.4000   0.5000   0.6000

  Columns 8 through 11

    0.7000   0.8000   0.9000   1.0000

exact =

  Columns 1 through 7

    2.7183   1.1000   0.5679   0.4353   0.4498   0.5183   0.6067

```
  Columns 8 through 11

    0.7025    0.8009    0.9003    1.0001


error =

  Columns 1 through 7

       0    1.0000    0.3679    0.1353    0.0498    0.0183    0.0067

  Columns 8 through 11

    0.0025    0.0009    0.0003    0.0001
```

Chapter 6, problem 6a

```
clear all;clc
A = [0 1 -2;1 -1 1;1 0 -1];
determ = det(A)


determ =

     0
```

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