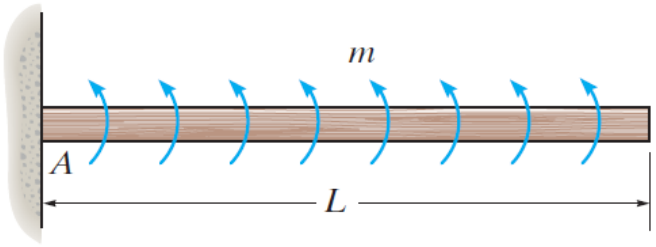
problem 6-25

6–25. The beam is subjected to the uniformly distributed moment m (moment/length). Draw the shear and moment diagrams for the beam.



Prob. 6–25

beam

```
u = symunit;
x = sym('x');
E = sym('E');
I = sym('I');
M = sym('M');
L = sym('L');

old_assum = assumptions;
clearassum;

b = beam;
b = b.add('reaction', 'force', 'Ra', 0);
b = b.add('reaction', 'moment', 'Ma', 0);
b = b.add('distributed', 'moment', M, [0 L]);
```

elastic curve

```
[y(x,E,I,M,L) dy(x,E,I,M,L) ...
 m(x,M,L) v(x,M,L) w(x,M,L) r] = b.elastic_curve(x, 'factor'); %#ok
y
```

```
y(x, E, I, M, L) =
```

$$\begin{cases} \frac{L\,M\,x^2}{2\,E\,I} & \text{if } 2\,x \le L \\ -\frac{L^2\,M\,(L-4\,x)}{8\,E\,I} & \text{if } L < 2\,x \end{cases}$$

```
dy
```

dy(x, E, I, M, L) =

$$\begin{cases} \frac{L\,M\,x}{\mathrm{E\,I}} & \text{if } 2\,x \le L \\ \frac{L^2\,M}{2\,\mathrm{E\,I}} & \text{if } L < 2\,x \end{cases}$$

```
m
```

m(x, M, L) =

$$\begin{cases} L\,M & \text{if } 2\,x \le L \\ 0 & \text{if } L < 2\,x \end{cases}$$

```
v
```

v(x, M, L) = 0

```
w
```

w(x, M, L) = 0

reactions

```
Ra = r.Ra %#ok
```

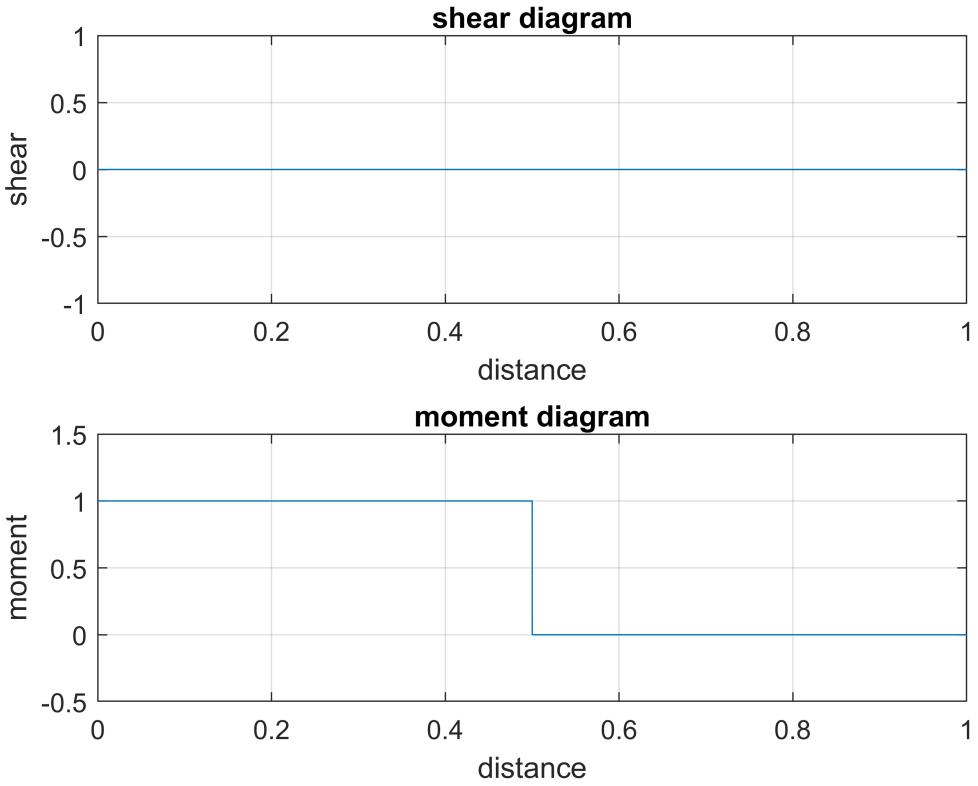
Ra = 0

```
Ma = r.Ma %#ok
```

Ma = $-L\,M$

shear and bending moment diagrams

```
beam.shear_moment(m, v, [0 1], [M L], 1);
subplot(2,1,2);
axis([0 1 -0.5 1.5]);
```



clean up

```
setassum(old_assum);
clear old_assum Ra Ma;
```