Remarks: See § 8.2, pages 557 till 575

Answers:

b) Maple code:

```
> w:=x -> q/EI/48*x^3*(2*x-3*L);
```

$$w := x \to \frac{q\,x^3\,(2\,x - 3\,L)}{48\,EI}$$

```
> wp:=diff(w(x),x);
```

$$wp := \frac{q\,x^2\,(2\,x - 3\,L)}{16\,EI} + \frac{q\,x^3}{24\,EI}$$

```
> wpp:=diff(wp,x);
```

$$wpp := \frac{q\,x\,(2\,x - 3\,L)}{8\,EI} + \frac{q\,x^2}{4\,EI}$$

```
> wppp:=diff(wpp,x);
```

$$wppp := \frac{q\,(2\,x - 3\,L)}{8\,EI} + \frac{3\,q\,x}{4\,EI}$$

```
> wpppp:=diff(wppp,x);
```

$$wpppp := \frac{q}{EI}$$

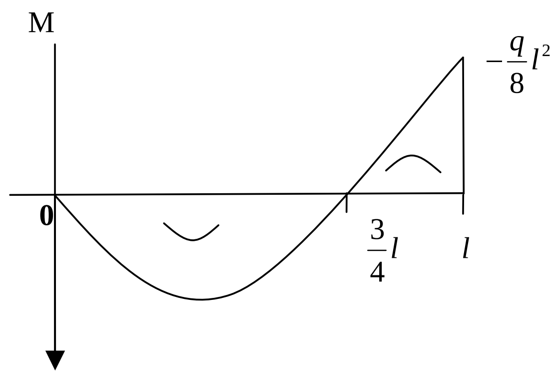
b)(continued)

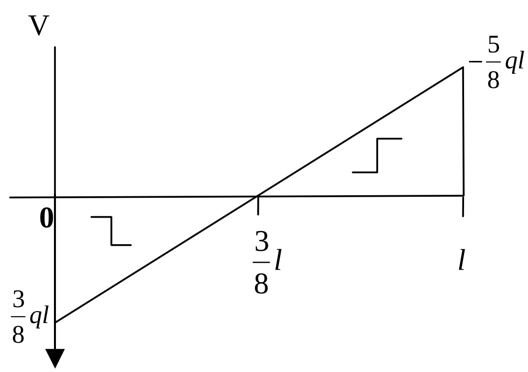
If the beam is subject to a uniformly distributed load q, the differential equation is $EI\,\frac{d^4w}{dx^4} = q$. Differentiating the equation of the elastic curve four times should give $EI\,\frac{d^4w}{dx^4} = q$

c)

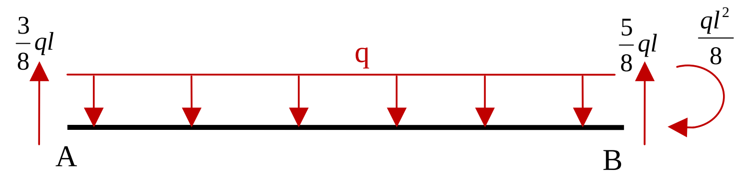
$$M(x) = -EIw'' = -\frac{q}{48}\left(24x^2 - 18lx\right)$$

$$V(x) = -EIw''' = -\frac{q}{48}\left(48x - 18l\right)$$





d)



e) The beam can be supported by a clamp at A. The load in that case consists of the distributed load q, and a concentrated load of $\frac{5}{8}ql$ and a torque of $\frac{ql^2}{8}$ at B.