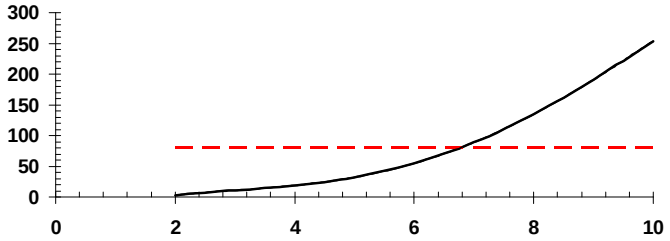
Solution 21.12

(a) A graph suggests that the mean value is about 80.



(b) Analytical solution:

$$\frac{\int_2^{10} -46+45x-14x^2+2x^3-0.075x^4\,dx}{10-2}$$

$$\frac{\left[-46x+22.5x^2-4.6667x^3+0.5x^4-0.015x^5\right]_2^{10}}{10-2}=\frac{623.3333-(-31.8133)}{8}=81.89333$$

(c) Numerical solution:

$$I=(5.2-2)\frac{2.8+4(15.27488)+35.81888}{6}$$

$$+(10-5.2)\frac{35.81888+3(81.14368+156.1645)+254}{8}$$

$$=53.18315+601.046=654.2292$$

$$\text{Average}=\frac{654.2292}{10-2}=81.77865$$

$$\varepsilon_t=\left|\frac{81.89333-81.77865}{81.89333}\right|\times 100\%=0.140\%$$