a. *Show that*

$$||w^h_{,x}||_{\Omega^e} \leq c_I h^{-1} ||w^h||_{\Omega^e}$$

for

i) *the two-node linear element* ($k = 1$)*; and*

ii) *the three-node quadratic element* ($k = 2$)*. Assume the nodes are equally spaced; see Figure 2.25.*

Determine the smallest c_I *in each case.*

b. *Show that*

$$||w^h_{,xx}||_{\Omega^e} \leq c_I h^{-1} ||w^h_{,x}||_{\Omega^e}$$

for the three-node element and determine the smallest c_I*.*

c. *Show that*

$$||w^h_{,xx}||_{\Omega^e} \leq c_I h^{-2} ||w^h||_{\Omega^e}$$

for the three-node element and determine the smallest c_I*.*