Chapter 10

10.1 QR Algorithm

$A^{(0)} = A$
`for` $k = 1, 2, \cdots$
  $Q^{(k)} R^{(k)} = A^{(k-1)}$
  $A^{(k)} = R^{(k)} Q^{(k)} = (Q^{(k)})^T A^{(k-1)} Q^{(k)}$

10.2 With Shift

$(Q^{(0)})^T A^{(0)} Q^{(0)} = A$
`for` $k = 1, 2, \cdots$
  `Pick shift` $\mu^{(k)}$`, e.g.` $\mu^{(k)} = A_{mm}^{(k-1)}$
  $Q^{(k)} R^{(k)} = A^{(k-1)} - \mu^{(k)} I$
  $A^{(k)} = R^{(k)} Q^{(k)} + \mu^{(k)} I = (Q^{(k)})^T A^{(k-1)} Q^{(k)}$

If any $A_{j,j+1}^{(k)}$ is "small", e.g. $< 0(\epsilon) \|A\|$, set it to 0 and break the problem in 2.