

6. Vectors **a**, **b**, **c** and **d** are given by

$$\mathbf{a} = \begin{pmatrix} 4 \\ -6 \end{pmatrix} \quad \mathbf{b} = \begin{pmatrix} 10 \\ p \end{pmatrix} \quad \mathbf{c} = \begin{pmatrix} q \\ 3 \end{pmatrix} \quad \mathbf{d} = \begin{pmatrix} 30 \\ 6 \end{pmatrix}$$

where p and q are constants.

Given that vectors **a** and **b** are parallel,

(a) find the value of p .

(2)

Given that

$$2|\mathbf{a} + \mathbf{c}| = |\mathbf{d}|$$

(b) find all possible values for q .

(4)