

18 It is given that two points  $A$  and  $B$  have position vectors

$$\overrightarrow{OA} = \begin{bmatrix} 5 \\ -1 \end{bmatrix} \text{ metres} \quad \text{and} \quad \overrightarrow{OB} = \begin{bmatrix} 13 \\ 5 \end{bmatrix} \text{ metres.}$$

18 (a) Show that the distance from  $A$  to  $B$  is 10 metres.

[3 marks]

18 (b) A constant resultant force, of magnitude  $R$  newtons, acts on a particle so that it moves in a straight line passing through the same two points  $A$  and  $B$

At  $A$ , the speed of the particle is  $3 \text{ m s}^{-1}$  in the direction from  $A$  to  $B$

The particle takes 2 seconds to travel from  $A$  to  $B$

The mass of the particle is 150 grams.

Find the value of  $R$

[3 marks]