

**2** The points  $A$  and  $B$  have position vectors  $3\mathbf{i} + 2\mathbf{j}$  and  $4\mathbf{i} + 2\mathbf{j} - 5\mathbf{k}$  respectively.

**(a)** Find the length of  $AB$ . **[2]**

Point  $P$  has position vector  $p\mathbf{i} - 3\mathbf{k}$ , where  $p$  is a constant.  $P$  lies on the circumference of a circle of which  $AB$  is a diameter.

**(b)** Find the two possible values of  $p$ . **[3]**