5.

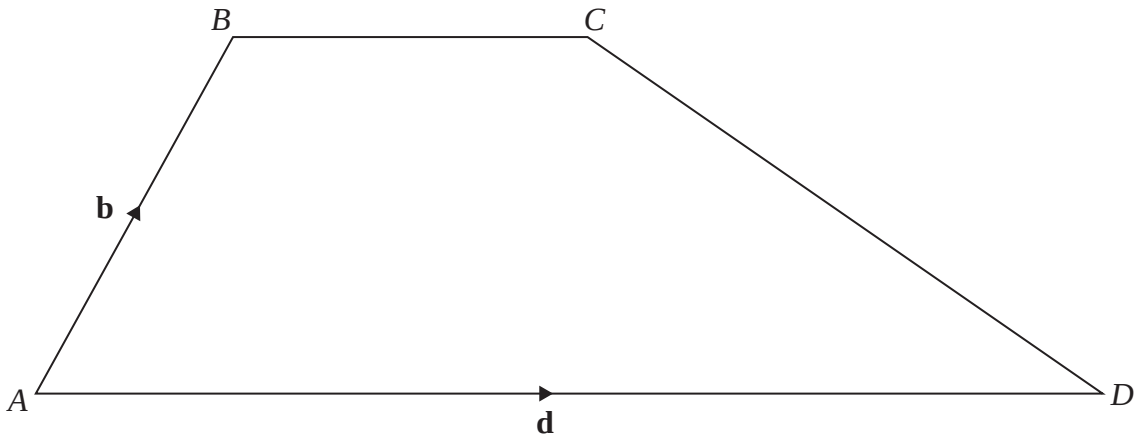

Figure 2

Figure 2 shows the trapezium $ABCD$ with AD parallel to BC.

Given that

- $\overrightarrow{AB} = \mathbf{b}$ and $\overrightarrow{AD} = \mathbf{d}$
- $AD = 3BC$
- M is the midpoint of AB
- N is the point on the line MC such that $MN : NC = 3 : 2$

(a) find in simplest form in terms of **b** and **d**

(i) $\overrightarrow{BD}$

(ii) $\overrightarrow{BN}$

(3)

(b) Hence show that points B, N and D are collinear.

(1)