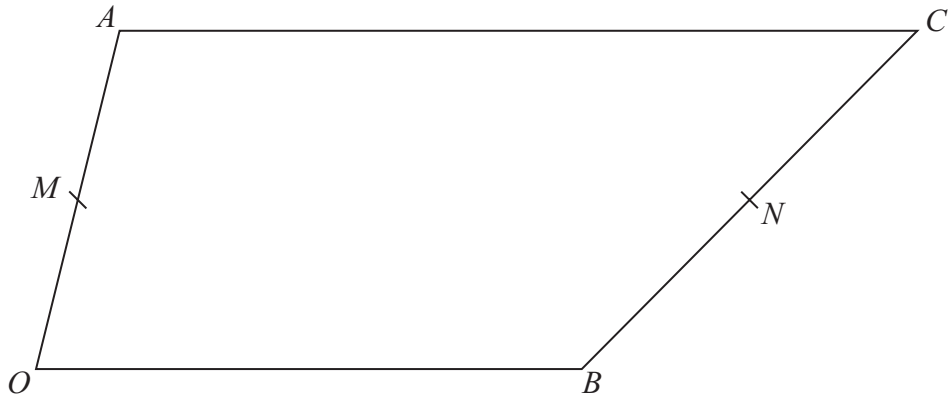
19 The diagram shows quadrilateral $OACB$.



M is the midpoint of OA.
N is the point on BC such that $BN : NC = 4 : 5$

$\overrightarrow{OA} = \mathbf{a}$ $\overrightarrow{OB} = \mathbf{b}$ $\overrightarrow{AC} = k\mathbf{b}$ where k is a positive integer.

(a) Express $\overrightarrow{MN}$ in terms of k, **a** and **b**.
Give your answer in its simplest form.

(4)

(b) Is MN parallel to OB?
Give a reason for your answer.

(1)