

27

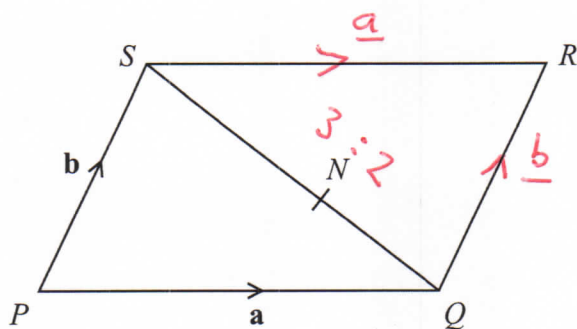


Diagram NOT  
accurately drawn

$PQRS$  is a parallelogram.

$N$  is the point on  $SQ$  such that  $SN : NQ = 3 : 2$

$$\vec{PQ} = \mathbf{a}$$

$$\vec{PS} = \mathbf{b}$$

(a) Write down, in terms of  $\mathbf{a}$  and  $\mathbf{b}$ , an expression for  $\vec{SQ}$ .

$$\begin{aligned}\vec{SQ} &= \vec{SP} + \vec{PQ} \\ &= -\underline{\underline{b}} + \underline{\underline{a}}\end{aligned}$$

$$\vec{SQ} = \underline{\underline{a}} - \underline{\underline{b}} \quad (1)$$

(b) Express  $\vec{NR}$  in terms of  $\mathbf{a}$  and  $\mathbf{b}$ .

$$\begin{aligned}\vec{NR} &= \vec{NQ} + \vec{QR} \\ &= \frac{2}{5} \vec{SQ} + \vec{QR} \\ &= \frac{2}{5} (\underline{\underline{a}} - \underline{\underline{b}}) + \underline{\underline{b}} \\ &= \frac{2}{5} \underline{\underline{a}} - \frac{2}{5} \underline{\underline{b}} + \underline{\underline{b}} \\ &= \frac{2}{5} \underline{\underline{a}} + \frac{3}{5} \underline{\underline{b}}\end{aligned}$$

$$\vec{NR} = \frac{2}{5} \underline{\underline{a}} + \frac{3}{5} \underline{\underline{b}} \quad (3)$$

(Total for Question 27 is 4 marks)

