

# Vector diagrams involving ratios

Maths

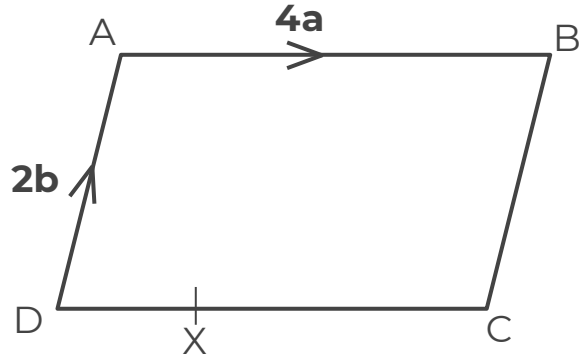
Miss Davies



# Vector diagrams involving ratios

1. The diagram shows a parallelogram.

$$DX:XC = 1:3$$



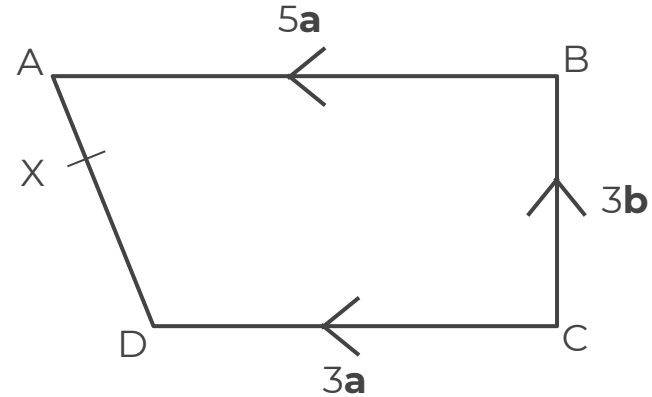
Write the following vectors in terms of  $\mathbf{a}$  and  $\mathbf{b}$ .

a)  $\overrightarrow{DX}$

b)  $\overrightarrow{AX}$

2. The diagram shows a trapezium.

$$AX:XD = 2:3$$



Write the following vectors in terms of  $\mathbf{a}$  and  $\mathbf{b}$ .

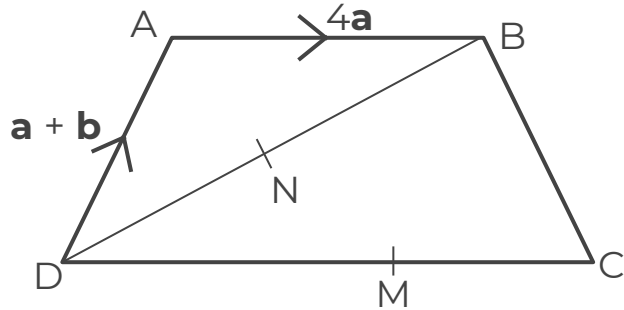
a)  $\overrightarrow{DX}$

b)  $\overrightarrow{BX}$



# Vector diagrams involving ratios

3. The diagram shows a trapezium.



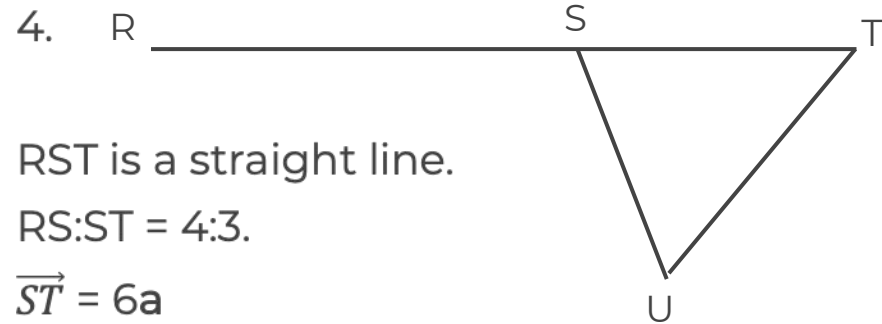
$$DC = 2AB$$

$$DM:MC = 3:2$$

N is the midpoint of BD

Write the following vectors in terms of  $\mathbf{a}$  and  $\mathbf{b}$ .

- a)  $\overrightarrow{DM}$     b)  $\overrightarrow{DN}$     c)  $\overrightarrow{MN}$     d)  $\overrightarrow{AM}$



RST is a straight line.

$$RS:ST = 4:3.$$

$$\overrightarrow{ST} = 6\mathbf{a}$$

$$\overrightarrow{TU} = 4\mathbf{b} - 3\mathbf{a}$$

$$\overrightarrow{US} = -3\mathbf{a} - 4\mathbf{b}$$

Write the following vectors in terms of  $\mathbf{a}$  and  $\mathbf{b}$ .

- a)  $\overrightarrow{RS}$                       b)  $\overrightarrow{RT}$                       c)  $\overrightarrow{RU}$



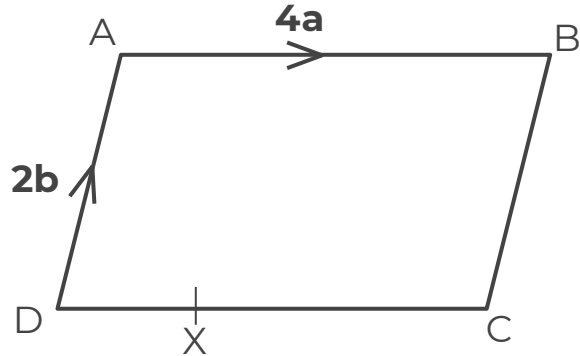
# Answers



# Vector diagrams involving ratios

1. The diagram shows a parallelogram.

$DX:XC = 1:3$



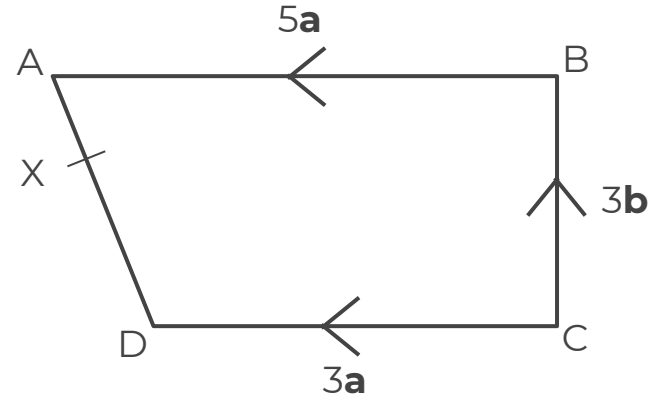
Write the following vectors in terms of  $\mathbf{a}$  and  $\mathbf{b}$ .

a)  $\overrightarrow{DX}$      $\mathbf{a}$

b)  $\overrightarrow{AX}$      $\mathbf{a} - 2\mathbf{b}$

2. The diagram shows a trapezium.

$AX:XD = 2:3$



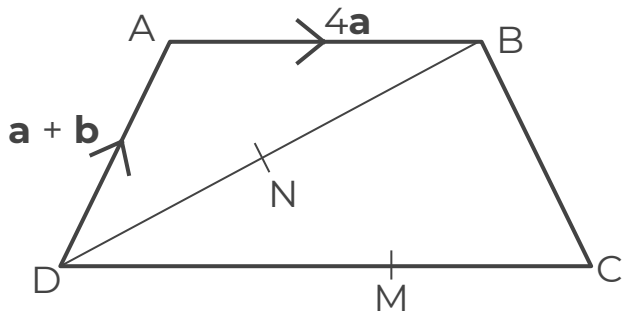
Write the following vectors in terms of  $\mathbf{a}$  and  $\mathbf{b}$ .

a)  $\overrightarrow{DX}$      $\frac{6}{5}\mathbf{a} + \frac{9}{5}\mathbf{b}$     b)  $\overrightarrow{BX}$      $\frac{21}{5}\mathbf{a} - \frac{6}{5}\mathbf{b}$



# Vector diagrams involving ratios

3. The diagram shows a trapezium.



$$DC = 2AB$$

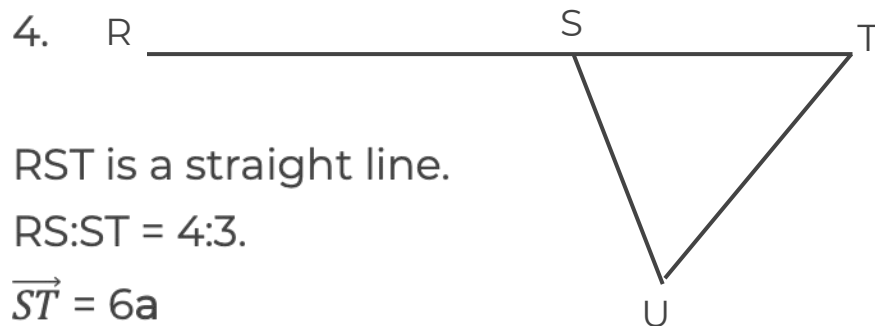
$$DM:MC = 3:2$$

N is the midpoint of BD

Write the following vectors in terms of  $\mathbf{a}$  and  $\mathbf{b}$ .

a)  $\overrightarrow{DM}$     b)  $\overrightarrow{DN}$     c)  $\overrightarrow{MN}$     d)  $\overrightarrow{AM}$

$\frac{24}{5}\mathbf{a}$      $\frac{5}{2}\mathbf{a} + \frac{1}{2}\mathbf{b}$      $\frac{1}{2}\mathbf{b} - \frac{23}{10}\mathbf{a}$      $\frac{19}{5}\mathbf{a} - \mathbf{b}$



RST is a straight line.

$$RS:ST = 4:3.$$

$$\overrightarrow{ST} = 6\mathbf{a}$$

$$\overrightarrow{TU} = 4\mathbf{b} - 3\mathbf{a}$$

$$\overrightarrow{US} = -3\mathbf{a} - 4\mathbf{b}$$

Write the following vectors in terms of  $\mathbf{a}$  and  $\mathbf{b}$ .

a)  $\overrightarrow{RS}$      $8\mathbf{a}$     b)  $\overrightarrow{RT}$      $14\mathbf{a}$     c)  $\overrightarrow{RU}$      $11\mathbf{a} + 4\mathbf{b}$

