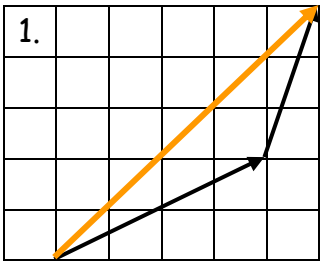
ANSWERS **To find the resultant by adding vectors**

Show a + b (i) as an addition of column vectors
(ii) using the triangle law of vector addition

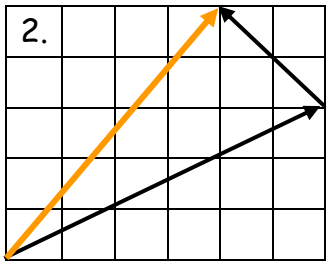
1. If a = $\begin{pmatrix} 4 \\ 2 \end{pmatrix}$ and b = $\begin{pmatrix} 1 \\ 3 \end{pmatrix}$



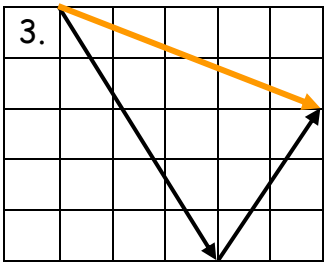
1. $\begin{pmatrix} 4 \\ 2 \end{pmatrix} + \begin{pmatrix} 1 \\ 3 \end{pmatrix} = \begin{pmatrix} 5 \\ 5 \end{pmatrix}$

2. If a = $\begin{pmatrix} 6 \\ 3 \end{pmatrix}$ and b = $\begin{pmatrix} -2 \\ 2 \end{pmatrix}$

2. $\begin{pmatrix} 6 \\ 3 \end{pmatrix} + \begin{pmatrix} -2 \\ 2 \end{pmatrix} = \begin{pmatrix} 4 \\ 5 \end{pmatrix}$



3. If a = $\begin{pmatrix} 3 \\ -5 \end{pmatrix}$ and b = $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$

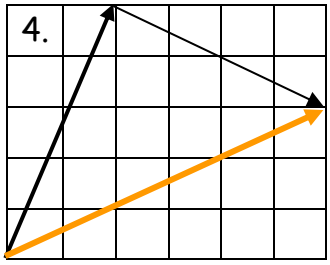


3. $\begin{pmatrix} 3 \\ -5 \end{pmatrix} + \begin{pmatrix} 2 \\ 3 \end{pmatrix} =$

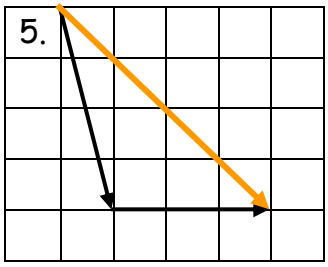
$\begin{pmatrix} 5 \\ -2 \end{pmatrix}$

4. If a = $\begin{pmatrix} 2 \\ 5 \end{pmatrix}$ and b = $\begin{pmatrix} 4 \\ -2 \end{pmatrix}$

4. $\begin{pmatrix} 2 \\ 5 \end{pmatrix} + \begin{pmatrix} 4 \\ -2 \end{pmatrix} = \begin{pmatrix} 6 \\ 3 \end{pmatrix}$



5. If a = $\begin{pmatrix} 1 \\ -4 \end{pmatrix}$ and b = $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$



5. $\begin{pmatrix} 1 \\ -4 \end{pmatrix} + \begin{pmatrix} 3 \\ 0 \end{pmatrix} = \begin{pmatrix} 4 \\ -4 \end{pmatrix}$

ANSWERS **(To Draw and Write Vectors)**

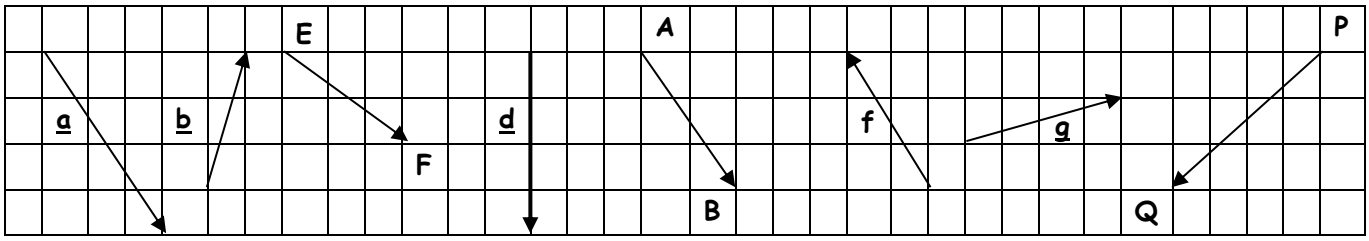
1.

$$b = \begin{pmatrix} -3 \\ -2 \end{pmatrix}, c = \begin{pmatrix} -2 \\ -2 \end{pmatrix}, d = \begin{pmatrix} -2 \\ 4 \end{pmatrix}$$

$$\overrightarrow{CD} = \begin{pmatrix} 4 \\ 2 \end{pmatrix}, EF = \begin{pmatrix} 0 \\ 2 \end{pmatrix}, GH = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

2.

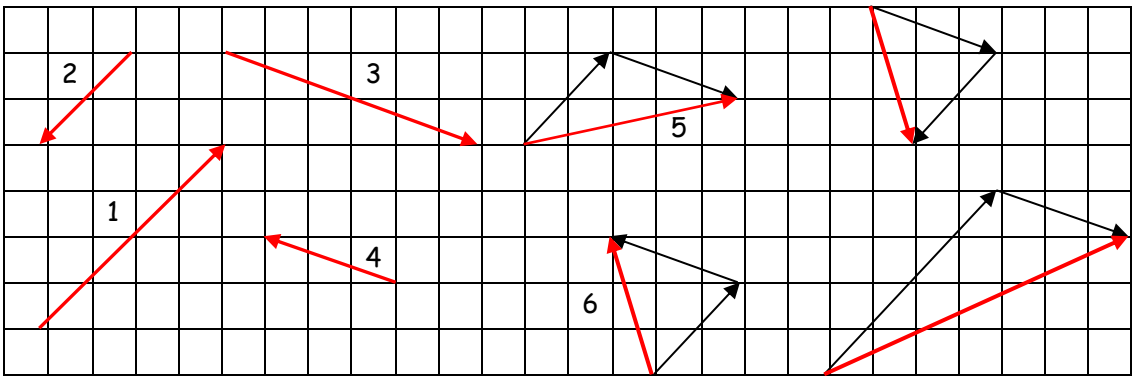
$\underline{a} = \begin{pmatrix} 3 \\ -4 \end{pmatrix}$ $b = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$ $\overrightarrow{EF} = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$ $d = \begin{pmatrix} 0 \\ -4 \end{pmatrix}$ $\overrightarrow{AB} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$ $f = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$ $g = \begin{pmatrix} 4 \\ 1 \end{pmatrix}$ $\overrightarrow{PQ} = \begin{pmatrix} -4 \\ -3 \end{pmatrix}$

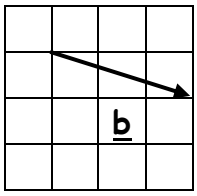


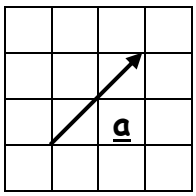
ANSWERS Parallel Vectors

(a) $\overrightarrow{CA} = -p$	(b) $\overrightarrow{AG} = 2q$	(c) $\overrightarrow{AB} = \frac{1}{2}p$	(d) $\overrightarrow{DF} = p$
(e) $\overrightarrow{HE} = -q$	(f) $\overrightarrow{AF} = p + q$	(g) $\overrightarrow{AH} = 2q + \frac{1}{2}p$	(h) $\overrightarrow{DC} = p - q$
(i) $\overrightarrow{CG} = -p + 2q$	(j) $\overrightarrow{IA} = p - 2q$	(k) $\overrightarrow{EC} = \frac{1}{2}p - q$	(l) $\overrightarrow{IB} = -2q - \frac{1}{2}p$

1. 2a
2. –a
3. 2b
4. –b
5. a + b
6. a – b
7. b – a
8. 2a + b







ANSWERS Magnitude of Vectors

(a) $\begin{pmatrix}3\\2\end{pmatrix}$ -- $\sqrt{13} = 3.61$

(b) $\begin{pmatrix}-4\\1\end{pmatrix}$ -- $\sqrt{17} = 4.12$

(c) $\begin{pmatrix}3\\-2\end{pmatrix}$ -- $\sqrt{13} = 3.61$

(d) $\begin{pmatrix}-6\\-6\end{pmatrix}$ -- $\sqrt{72} = 8.49$

(e) $\begin{pmatrix}5\\-2\end{pmatrix}$ -- $\sqrt{29} = 5.39$

(f) $\begin{pmatrix}-4\\3\end{pmatrix}$-- $\sqrt{25} = 5$