Column Vectors

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1: Calculate the following:

a) $\begin{pmatrix}0\\-3\end{pmatrix}+\begin{pmatrix}-1\\-3\end{pmatrix}$ b) $\begin{pmatrix}-9\\-8\end{pmatrix}+\begin{pmatrix}-10\\-2\end{pmatrix}$ c) $\begin{pmatrix}4\\-1\end{pmatrix}+\begin{pmatrix}-5\\8\end{pmatrix}$ d) $\begin{pmatrix}-8\\-4\end{pmatrix}+\begin{pmatrix}-6\\-5\end{pmatrix}$

2: Calculate the following:

a) $\begin{pmatrix}-2\\-4\end{pmatrix}-\begin{pmatrix}-3\\-7\end{pmatrix}$ b) $\begin{pmatrix}-10\\8\end{pmatrix}-\begin{pmatrix}-3\\6\end{pmatrix}$ c) $\begin{pmatrix}3\\-2\end{pmatrix}-\begin{pmatrix}-3\\-5\end{pmatrix}$ d) $\begin{pmatrix}-2\\-9\end{pmatrix}-\begin{pmatrix}0\\1\end{pmatrix}$

3: Calculate the following:

a) $0\begin{pmatrix}4\\6\end{pmatrix}$ b) $6\begin{pmatrix}10\\0\end{pmatrix}$ c) $6\begin{pmatrix}10\\10\end{pmatrix}$ d) $-2\begin{pmatrix}6\\-3\end{pmatrix}$

4: Calculate the following:

a) Are vectors $\begin{pmatrix}1\\-6\end{pmatrix}$ and $\begin{pmatrix}-20\\35\end{pmatrix}$ parallel?

b) Are vectors $\begin{pmatrix}32\\-16\end{pmatrix}$ and $\begin{pmatrix}8\\4\end{pmatrix}$ parallel?

c) Are vectors $\begin{pmatrix}8\\-6\end{pmatrix}$ and $\begin{pmatrix}4\\-3\end{pmatrix}$ parallel?

d) Are vectors $\begin{pmatrix}10\\1\end{pmatrix}$ and $\begin{pmatrix}-30\\-3\end{pmatrix}$ parallel?

5: Calculate the following:

a) If A = (–3, –1) and B = (9, 3), find the vector from A to B.

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b) If A = (9, 4) and B = (2, –4), find the vector from A to B.

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c) If A = (2, –9) and B = (4, 1), find the vector from B to A.

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d) If A = (6, –7) and B = (–2, –5), find the vector from B to A.

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6: Calculate the following:

a) Find the magnitude of the vector $\begin{pmatrix} -6 \\ 3 \end{pmatrix}$.

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b) Find the magnitude of the vector $\begin{pmatrix} 4 \\ -6 \end{pmatrix}$.

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c) Find the magnitude of the vector $\begin{pmatrix} -6 \\ -1 \end{pmatrix}$.

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d) Find the magnitude of the vector $\begin{pmatrix} -3 \\ -8 \end{pmatrix}$.

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Answers

1:	a) $\begin{pmatrix}-1\\-6\end{pmatrix}$	b) $\begin{pmatrix}-19\\-10\end{pmatrix}$	c) $\begin{pmatrix}-1\\7\end{pmatrix}$	d) $\begin{pmatrix}-14\\-9\end{pmatrix}$
2:	a) $\begin{pmatrix}1\\3\end{pmatrix}$	b) $\begin{pmatrix}-7\\2\end{pmatrix}$	c) $\begin{pmatrix}6\\3\end{pmatrix}$	d) $\begin{pmatrix}-2\\-10\end{pmatrix}$
3:	a) $\begin{pmatrix}0\\0\end{pmatrix}$	b) $\begin{pmatrix}60\\0\end{pmatrix}$	c) $\begin{pmatrix}60\\60\end{pmatrix}$	d) $\begin{pmatrix}-12\\6\end{pmatrix}$
4:	a) No	b) No	c) Yes	d) Yes
5:	a) $\begin{pmatrix}12\\4\end{pmatrix}$	b) $\begin{pmatrix}-7\\-8\end{pmatrix}$	c) $\begin{pmatrix}-2\\-10\end{pmatrix}$	d) $\begin{pmatrix}8\\-2\end{pmatrix}$
6:	a) $\sqrt{45} = 6.71$	b) $\sqrt{52} = 7.21$	c) $\sqrt{37} = 6.08$	d) $\sqrt{73} = 8.54$