Find the length of a column vector

Maths

Miss Davies

Find the length of a column vector

1. Calculate the length of each vector.

a) $\begin{pmatrix} 5 \\ 12 \end{pmatrix}$

b) $\begin{pmatrix} 9 \\ 12 \end{pmatrix}$

c) $\begin{pmatrix} -20 \\ 15 \end{pmatrix}$

d) $\begin{pmatrix} -8 \\ -15 \end{pmatrix}$

e) $\begin{pmatrix} 18 \\ -15 \end{pmatrix}$

f) $\begin{pmatrix} 14 \\ 7 \end{pmatrix}$

2. The length of vector **a** is 35 units.

$\mathbf{a} = \begin{pmatrix} x \\ 21 \end{pmatrix}$.

Find the value of x.

3. The length of vector **b** is 75 units.

$\mathbf{b} = \begin{pmatrix} 21 \\ y \end{pmatrix}$.

Find the value of y

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4. $\mathbf{r} = \begin{pmatrix} 9 \\ 12 \end{pmatrix}$.

Calculate the length of $3\mathbf{r}$.

Answers

Find the length of a column vector

1. Calculate the length of each vector.

a) $\begin{pmatrix} 5 \\ 12 \end{pmatrix}$ 13 units b) $\begin{pmatrix} 9 \\ 12 \end{pmatrix}$ 15 units

c) $\begin{pmatrix} -20 \\ 15 \end{pmatrix}$ 25 units d) $\begin{pmatrix} -8 \\ -15 \end{pmatrix}$ 17 units

e) $\begin{pmatrix} 18 \\ -15 \end{pmatrix}$ 23.4 units f) $\begin{pmatrix} 14 \\ 7 \end{pmatrix}$ 15.7 units

2. The length of vector **a** is 35 units.

$\mathbf{a} = \begin{pmatrix} x \\ 21 \end{pmatrix}$.

Find the value of x.

$x = 28$

3. The length of vector **b** is 75 units.

$\mathbf{b} = \begin{pmatrix} 21 \\ y \end{pmatrix}$.

Find the value of y

$y = 72$

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4. $\mathbf{r} = \begin{pmatrix} 9 \\ 12 \end{pmatrix}$.

Calculate the length of $3\mathbf{r}$.

45 units