# Vectors: Air Traffic Control

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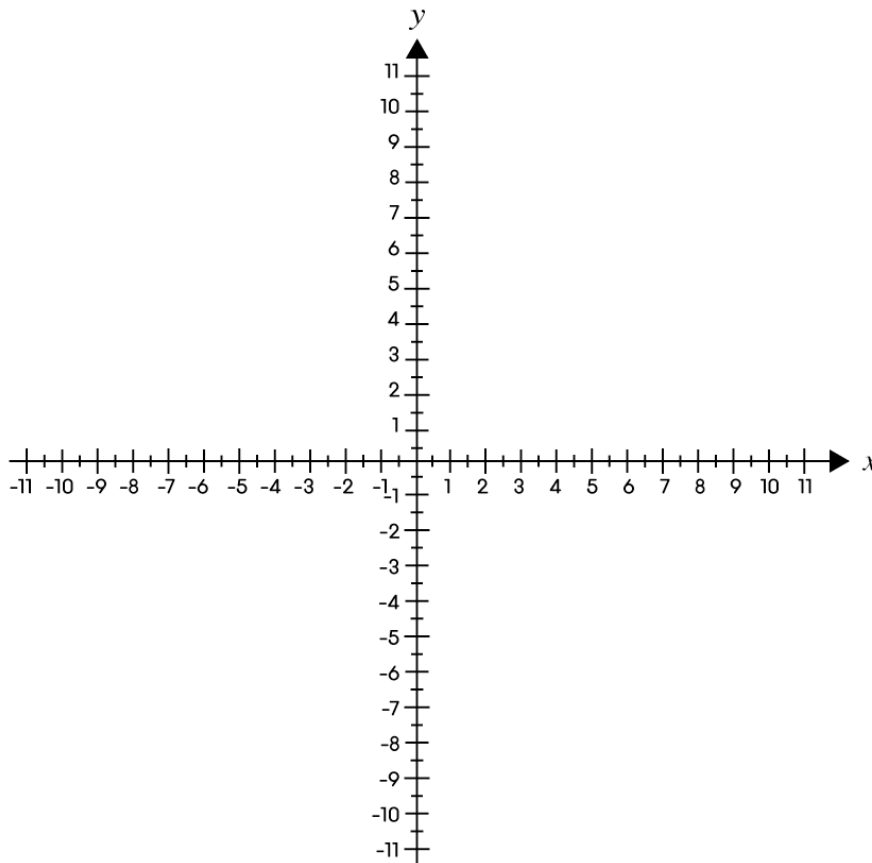
**Basic**

1) Sheila is standing facing north-west. If she turns 225˚ in a clockwise direction, which way will she then be facing?

2) On an $x$, $y$ graph, plot the points (2,3), (-3,2), (2,6) and (-3,6). Join the points and state what shape they form.

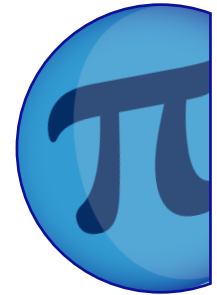NAME: ............................................................................

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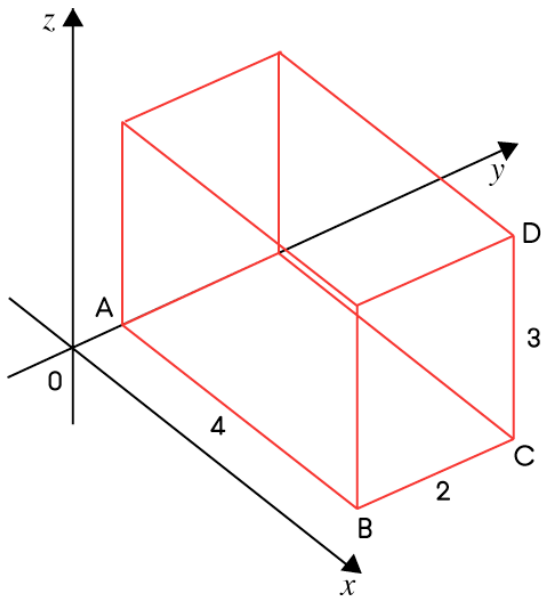
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**Basic**

3) On the diagram below, if A is the point (0,1,0), find the coordinates of B, C and D.
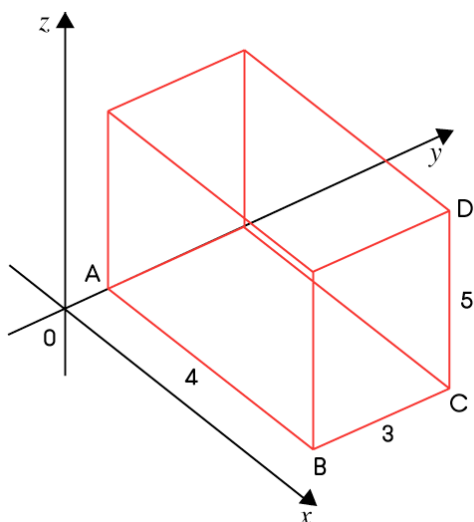
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**Core**

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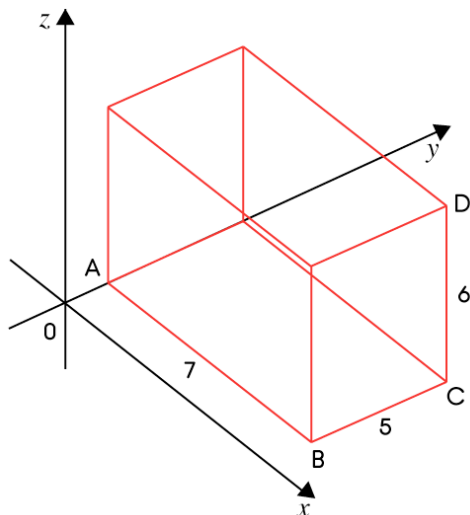1) On the diagram below, if A is the point (0,1,0), find the coordinates of B, C and D.



2) On the diagram below, which points have the following coordinates, given that A is (0,1,0)?
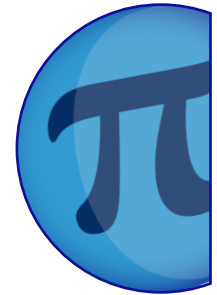
a) (7,6,0)　　　　b) (7,1,0)　　　　c) (7,6,6)

**Twig**

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**Advanced**

1) What is a vector?

2) If $u = \begin{bmatrix} 2 \\ 1 \\ -1 \end{bmatrix}$ and $v = \begin{bmatrix} -2 \\ 1 \\ 3 \end{bmatrix}$ what is:

a) $u + v$                                                  b) $u - v$

3) If $u = \begin{bmatrix} 1 \\ -1 \\ 3 \end{bmatrix}$ calculate $2u$.

4) Using the points A (2,-3,4), B (8,3,1) and C (12,7,-1), find:

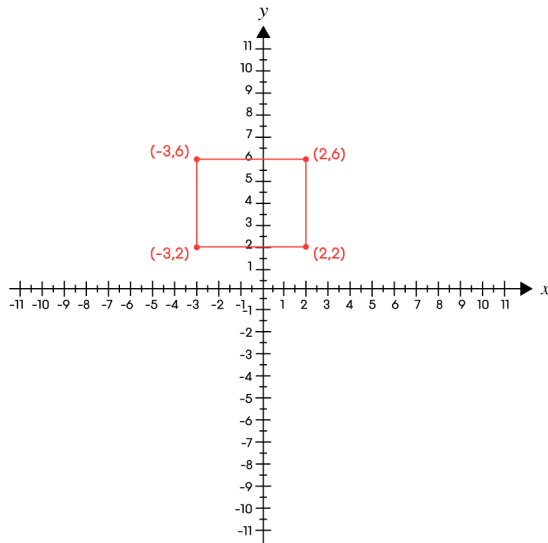a) $\overrightarrow{AB}$                                        b) $\overrightarrow{BC}$

**ANSWERS**

**Basic**

**1) South**

**2)**



**3) B = (4,1,0), C = (4,3,0), D = (4,3,3)**

**Core**

**1) B = (4,1,0), C = (4,4,0), D = (4,4,5)**

**2) a) C**  **b) B**  **c) D**

**Advanced**

**1) A vector is a quantity that has magnitude and direction.**

**2) 2) a)** $u + v = \begin{bmatrix} 0 \\ 2 \\ 2 \end{bmatrix}$   **b)** $u - v = \begin{bmatrix} 4 \\ 0 \\ -4 \end{bmatrix}$

**3) 2u =** $\begin{bmatrix} 2 \\ -2 \\ 6 \end{bmatrix}$

**4)**

**a)** $\overrightarrow{AB} = \begin{bmatrix} 6 \\ 6 \\ -3 \end{bmatrix}$   **b)** $\overrightarrow{BC} = \begin{bmatrix} 4 \\ 4 \\ -2 \end{bmatrix}$