

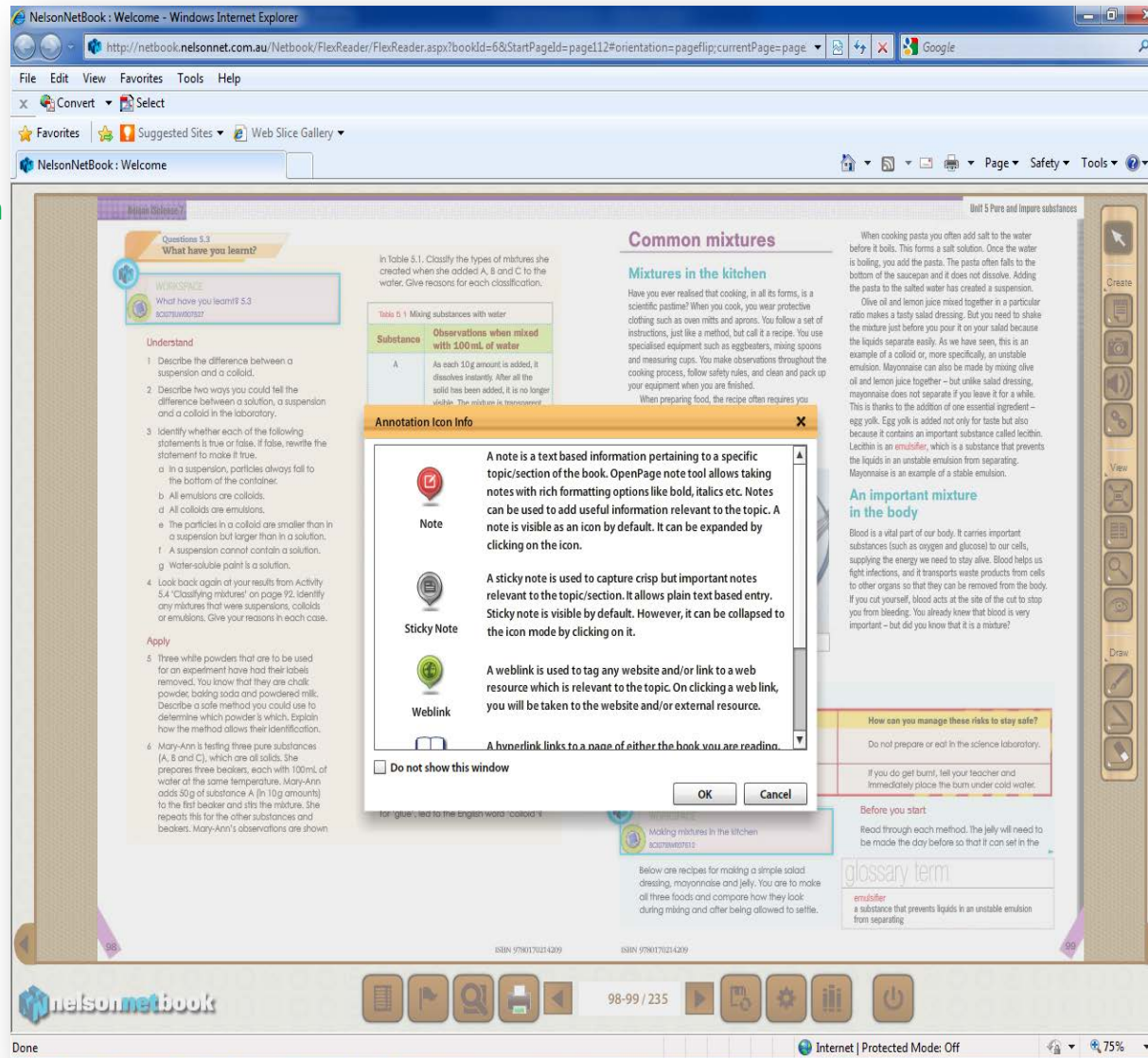
NELSONNETBOOK - Teacher



NelsonNetBook

On opening the eBook an “Annotation Icon Info” panel reminds the user about the functions of each of the annotation tools.

This box can be turned off.



Tools

All the tools are on the toolbar.

- Notes
- Sticky notes
- Snapshot
- Sound file
- Hyperlink
- Weblink
- Layout options
- Hide
- Pen
- Highlighter and Eraser

For further information on how each of these tools function, please refer to your Nelson Cengage Secondary catalogue.

The screenshot shows a web browser window displaying the NelsonNetBook interface. The page content includes a chapter introduction, a table of mathematical terms, and a section on plotting points and lines. A red arrow points to the toolbar on the right side of the page, which contains various interactive tools like a cursor, eraser, highlighter, and drawing tools.

Chapter 4
Functions and graphs

The graph of a function can tell you a great deal. The way the graph changes tells you about how the function changes. The study of functions and their graphs helps scientists to accurately describe the world. This allows engineers to accurately predict how bridges, cars, trains, and other structures and machines will behave when they are built. In this chapter you will learn to learn how algebra and geometry are related through graphs of functions.

Mathematical literacy

The mathematical words below have special meanings that you will learn in this chapter. It is important that you learn to spell them and gradually learn what they mean in mathematics. You may find the glossary or online mathematical dictionary useful for this purpose.

Cartesian plane	input	output	step function
coordinates	intercept	parabola	table of values
dependent	linear function	quadrant	word graph
function	linear graph	rise	variable
gradient	midpoint	run	x-axis
independent	origin	slope	y-axis

4.1 Plotting points and lines

You have already learnt something about the Cartesian plane.

Important

The Cartesian plane
The Cartesian plane has two axes at right angles. It is also called a **number lattice**.
The horizontal axis is called the **x-axis**, the vertical axis is called the **y-axis**. The axes cross at the **origin**.
The position of a point on the Cartesian plane is determined by its **coordinates**.
The **x-coordinate** gives the horizontal position of the point from the origin, and the **y-coordinate** is the vertical position of the point from the origin. Coordinates are shown in parentheses (read *brackets*) with a comma between them. The **x-coordinate** is always shown *first* and the **y-coordinate** is shown *last*. The origin is the point (0, 0).
Each quarter of the Cartesian plane is called a **quadrant**.
In the diagram, Point A is written as (3, 2), B is (-2, 2), C is (-3, -1) and D is (4, -3).

Example 1

Plot each of the following points on Cartesian axes and state its quadrant or axis.
 $A(-3, -1)$, $B(0, -2)$, $C(1, -2)$, $D(0, 0)$, $E(3, 1)$, $F(0, 1)$, $G(-2, 2)$, $H(7, 0)$

Solution

Draw and label axes to cover the five biggest squares.

To plot $A(-3, -1)$ go down from -1 on the x-axis.
Then go left from -3 on the y-axis.
Place a point at their intersection and label it.

Do the same for all the other points.

State the quadrant or axis of each point.

- $A(-3, -1)$ is in the third quadrant
- $B(0, -2)$ is on the y-axis
- $C(1, -2)$ is in the fourth quadrant
- $D(0, 0)$ is on the x-axis
- $E(3, 1)$ is in the first quadrant
- $F(0, 1)$ is on the y-axis
- $G(-2, 2)$ is in the second quadrant
- $H(7, 0)$ is on the x-axis

Navigation

Icons from left to right

- Table of Content
- Bookmark
- Search
- Print
- Page left
- Page Number
- Page Right
- Save
- Settings
- My Books
- Log Out

SAVE enables the user to save Annotations and Notes. This is particularly important when making use of the Online/Offline functionality.

The screenshot shows the NelsonNetBook interface in a Windows Internet Explorer browser. The page is titled "NELSON THINK MATHS 8" and "www.Australian Curriculum 8". The main content area is titled "4.1 Plotting points and lines" and includes a section on the Cartesian plane. A red arrow points to the "Save" icon in the navigation bar at the bottom of the page.

Mathematical literacy table:

Cartesian plane	input	output	step function
coordinates	intercept	parabola	table of values
dependent	linear function	quadrant	trend graph
function	linear graph	rise	variable
gradient	midpoint	run	x-axis
independent	origin	solution	y-axis

4.1 Plotting points and lines

You have already learnt something about the Cartesian plane.

Important

The Cartesian plane has two axes at right angles. It is also called a **number line**. The horizontal axis is called the **x-axis**, the vertical axis is called the **y-axis**. The axes cross at the **origin**.

The position of a point on the Cartesian plane is determined by its **coordinates**. The **abscissa** gives the horizontal position of the point from the origin, and the **ordinate** is the vertical position of the point from the origin. Coordinates are shown in parentheses (round brackets) with a comma between them. The **x**-coordinate is always shown **first** and the **y**-coordinate **last**. The origin is the point $(0, 0)$. Each quarter of the Cartesian plane is called a **quadrant**. In the diagram, Point A is written as $(1, 2)$, B is $(2, 2)$, C is $(-1, -1)$ and D is $(4, -3)$.

Example 1

Plot each of the following points on Cartesian axes and state its quadrant or axis.

$A(7, -3)$, $B(0, 7)$, $C(1, -2)$, $D(6, 0)$, $E(3, 5)$, $F(0, 3)$, $G(-2, 2)$, $H(-7, 0)$

Solution

Draw and label axes to cater for the biggest number.

To plot $A(-1, 3)$ go down from -1 on the x -axis. Then go left from 3 on the y -axis. Place a point at their intersection and label it.

Do the same for all the other points.

State the quadrant or axis of each point.

- $A(-1, 3)$ is in the third quadrant
- $B(0, 7)$ is on the y -axis
- $C(1, -2)$ is in the fourth quadrant
- $D(6, 0)$ is on the x -axis
- $E(3, 5)$ is in the first quadrant
- $F(0, 3)$ is on the y -axis
- $G(-2, 2)$ is in the second quadrant
- $H(-7, 0)$ is on the x -axis