

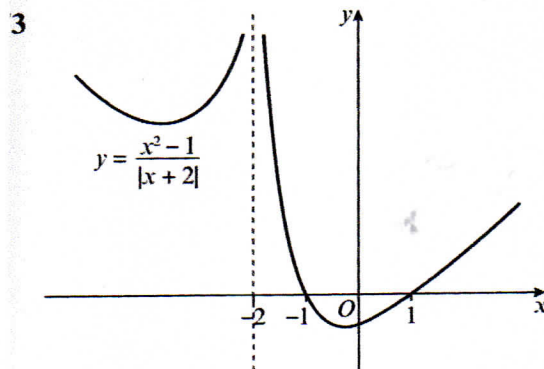
Assignment Test 4.

1. The points A and B have position vectors $\mathbf{i} - \mathbf{j} + 3\mathbf{k}$ and $4\mathbf{i} + 3\mathbf{j} - 2\mathbf{k}$ respectively.
- Find $|\overrightarrow{AB}|$. (2)
 - Find a vector equation for the line l_1 which passes through the points A and B . (2)
- A second line l_2 has vector equation $\mathbf{r} = 6\mathbf{i} + 4\mathbf{j} - 3\mathbf{k} + \mu(2\mathbf{i} + \mathbf{j} - \mathbf{k})$
- Show that the line l_2 also passes through B . (2)
 - Find the size of the acute angle between l_1 and l_2 . (3)
 - Hence, or otherwise, find the shortest distance from A to l_2 . (3)

2. a Sketch, on the same set of axes, the graph of $y = |(x-2)(x-4)|$, and the line with equation $y = 6 - 2x$. (3)
- b Find the exact values of x for which $|(x-2)(x-4)| = 6 - 2x$. (3)
- c Hence solve the inequality $|(x-2)(x-4)| < 6 - 2x$. (2)

* axes labelled
arrows
origin
use a ruler.

← Section 4.3



The diagram above shows a sketch of the curve with equation

$$y = \frac{x^2 - 1}{|x + 2|}, \quad x \neq -2$$

The curve crosses the x -axis at $x = 1$ and $x = -1$ and the line $x = -2$ is an asymptote of the curve.

- a Use algebra to solve the equation $\frac{x^2 - 1}{|x + 2|} = 3(1 - x)$ (6)

- b Hence, or otherwise, find the set of values of x for which

$$\frac{x^2 - 1}{|x + 2|} < 3(1 - x)$$

Give your answer using set notation.

(2)