MATHS TEST

Time allowed: 45 min

Question1

Prove the identity;

$$\left(\frac{a+\sqrt{a^2-1}}{a-\sqrt{a^2-1}}+\frac{1-\frac{a}{\sqrt{a^2-1}}}{1+\frac{a}{\sqrt{a^2-1}}}\right):\left(\frac{\sqrt{a-\frac{1}{a}}}{\sqrt{\frac{1}{a}}}\right)=4a$$

Question2

Solve the simultaneous equations:

$$\begin{cases}2x-y=1\\2x^2-y^2+x+y=-11\end{cases}$$

Question 3

Find all the values of a such that the equation has exactly one real root:

$x^2+2ax+12-a=0$

Question 4

Sketch the graph of the function $y=-2x^2+3x+2$ where $x\in\left[-\frac{1}{2};2\right]$.