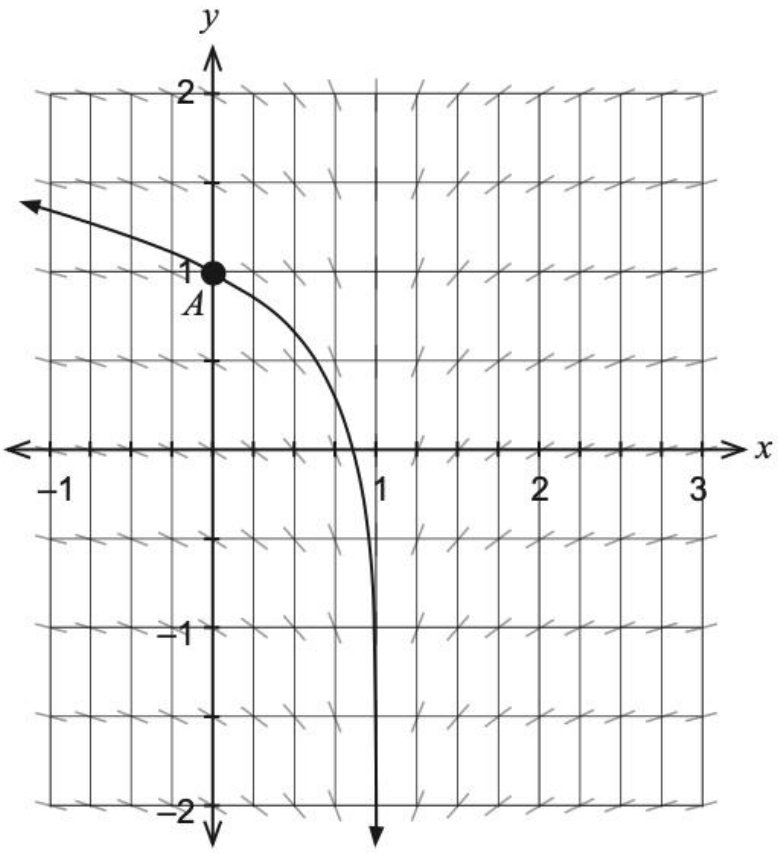
Question 11 **(7 marks)**

A series of magnets is placed under a glass pane and some iron filings are sprinkled onto the glass. The orientation or slope of the iron filings, as determined by the magnetic field, is shown below. One of the lines of magnetic force that passes through the point $A\ (0,1)$ is also shown.



The slope field is given by $\frac{dy}{dx} = \frac{1}{2x-2}$, $x \neq 1$.

(a) Determine the value of the slope field at the point $A\ (0,1)$. (2 marks)

(b) Explain the orientation of the iron filings at $x = 1$. (1 mark)

(c) Determine the equation for the line of force that passes through the point $A\ (0,1)$.

(4 marks)