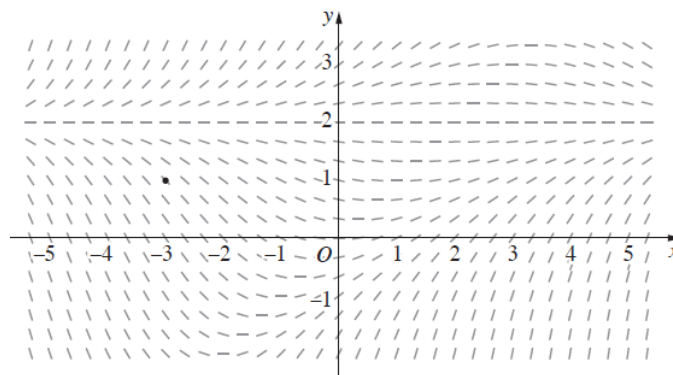


**SP 11** The trajectories of particles in a  
**MX c** fluid are described by the  
**1** differential equation

$$\frac{dy}{dx} = \frac{1}{4}(y-2)(y-x).$$

The slope field for the differential equation is sketched.

(i) Identify any solutions of the form  $y = k$ , where  $k$  is a constant.

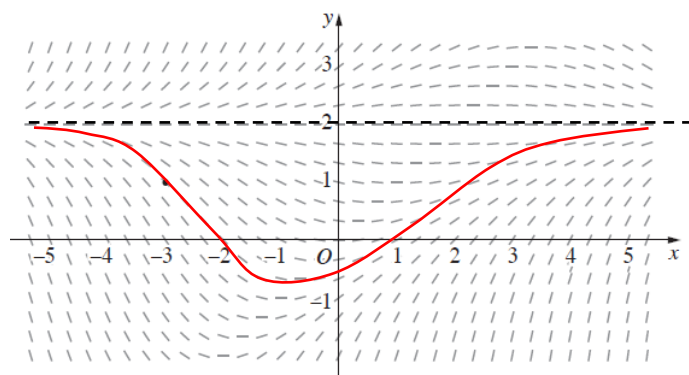


(ii) Draw a sketch of the trajectory of a particle in the fluid which passes through the point  $(-3, 1)$  and describe the trajectory as  $x \rightarrow \pm \infty$ .

(i)  $\frac{dy}{dx} = 0$  when  $y = 2$ .

Hence  $k = 2$ .

(ii)



As  $x \rightarrow \pm \infty$ , the particle approaches  $y = 2$  from below.

\* These solutions have been provided by [projectmaths](http://projectmaths.com.au) and are not supplied or endorsed by NESA.

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