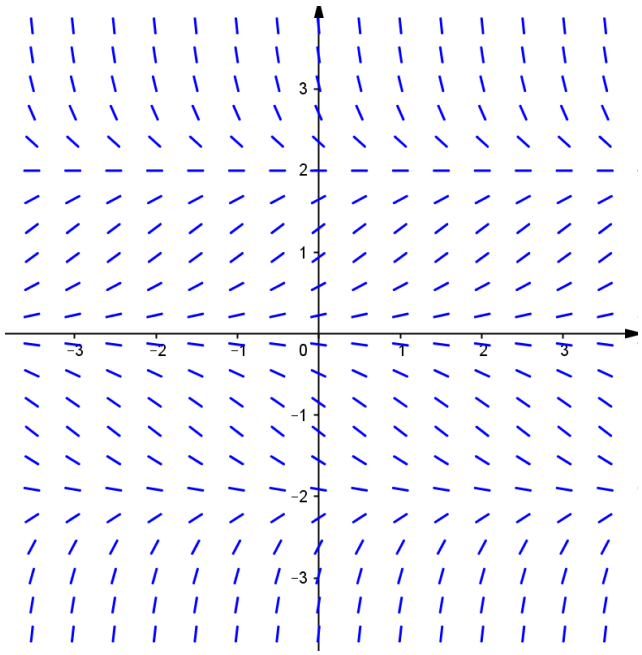
1) A direction field for the differential equation $y' = y\left(1 - \frac{1}{4}y^2\right)$ is shown.



a) Sketch the graphs of the solutions that satisfy the given initial conditions.

i. $y(0) = 1$

ii. $y(0) = -1$

iii. $y(0) = -3$

iv. $y(0) = 3$

b) Find all the equilibrium solutions.

Match the differential equation with its direction field (labeled I-IV). Give reasons for your answer.

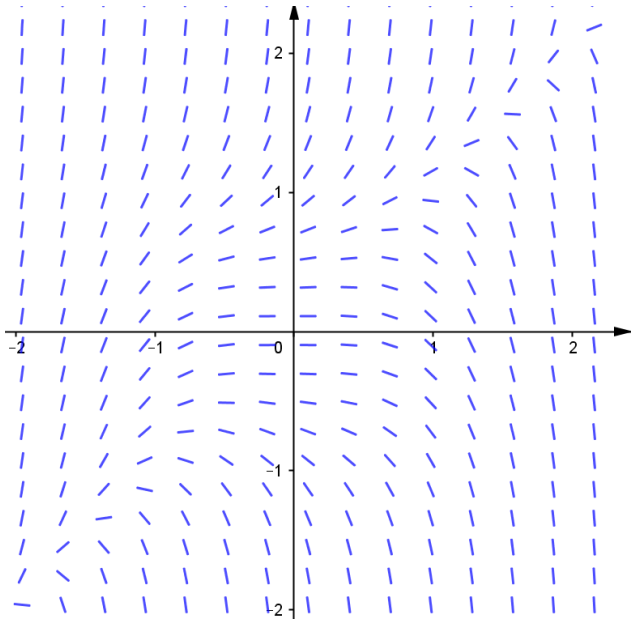
2) $y' = y - 1$

3) $y' = y - x$

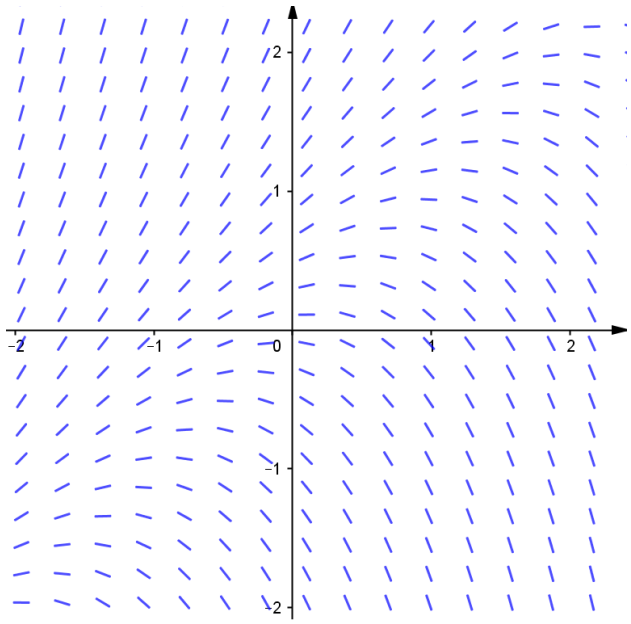
4) $y' = y^2 - x^2$

5) $y' = y^3 - x^3$

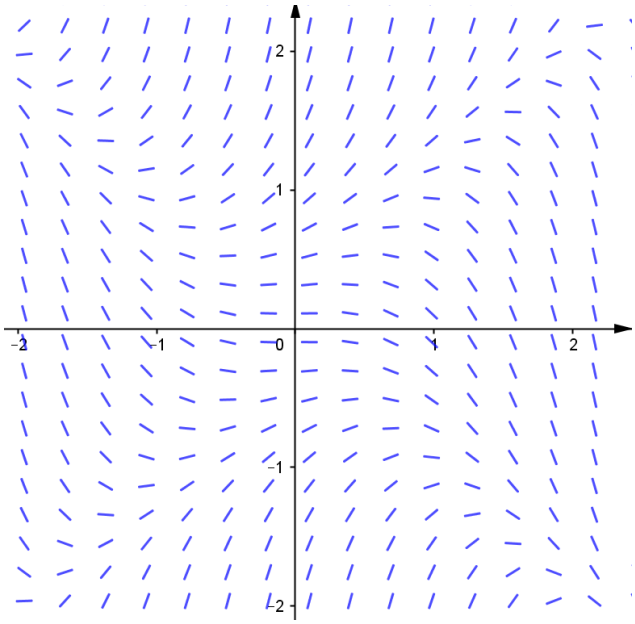
I



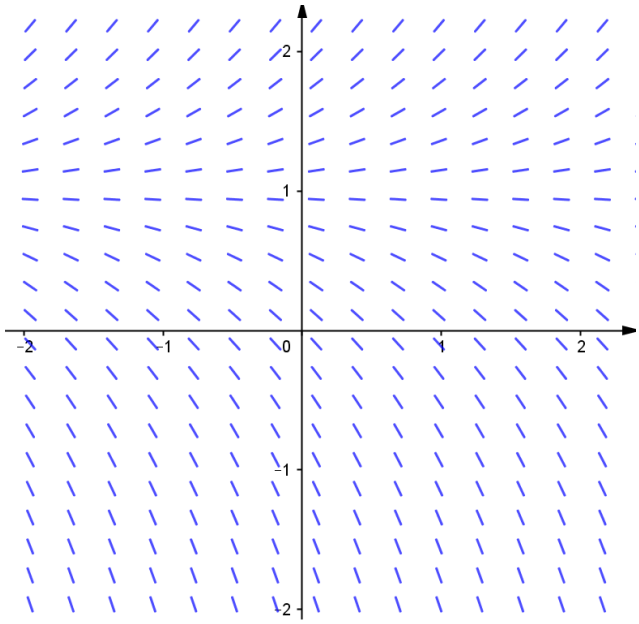
II



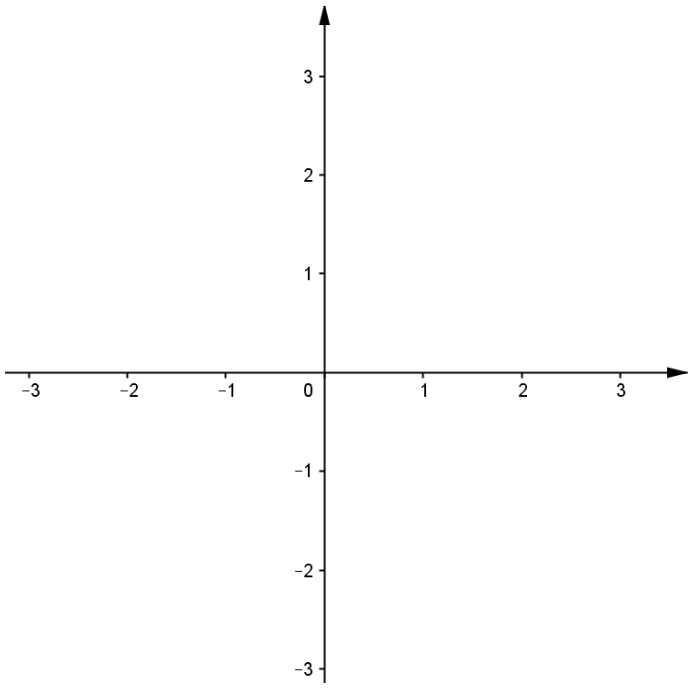
III



IV



6) Sketch a direction field for the differential equation $y' = 1 + y$. Then sketch the solution curves that go through the points $(0,0)$, $(0,-1)$, $(0,-2)$.



7) Sketch the direction field of the differential equation $y' = y - 2x$. Then sketch the solution curve that passes through the point $(1,0)$.