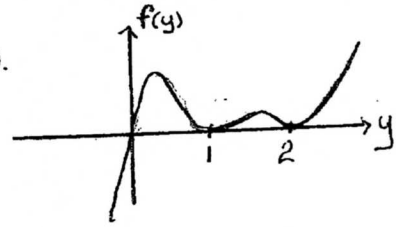
(b) Consider the differential equation

$$\frac{dy}{dt} = f(y),$$

where $f(y)$ is a given function with the following characteristics.

- $f(y) = 0$ only at $y = 0$, $y = 1$, and $y = 2$
- $f(y)$ is negative for $y < 0$ and $f(y) \geq 0$ for $y > 0$.



On the set of axes below, sketch the solutions passing through the following points:

i. $y(0) = -2$ ii. $y(1) = \frac{1}{2}$

iii $y(-3) = \frac{5}{4}$ iv. $y(4) = 3$

For each solution, indicate clearly the asymptotic behavior of y as t grows or becomes negative.