

Ex. Match the direction field plot with the DE.

(A) From the plot it is clear that $\frac{dy}{dx} \geq 0$.

The only possible match is (iv) $\frac{dy}{dx} = x^2 + y^2$.

(B) From the plot it seems $\frac{dy}{dx} = 0$ if $x=0$ and $\frac{dy}{dx} = \text{undef.}$ if $y=0$.

The only possible match is

(ii) $\frac{dy}{dx} = -\frac{x}{y}$.

Also it looks like the ~~only~~ curves have the form $x^2 + y^2 = C$.

$$2x + 2y \frac{dy}{dx} = 0 \quad \Leftrightarrow \quad \frac{dy}{dx} = -\frac{x}{y}.$$

(C) From the plot it seems $\frac{dy}{dx}$ is a function of x only. When x is fixed and y changes $\frac{dy}{dx}$ does not seem to change.

The only possible match is

(i) $\frac{dy}{dx} = x$.