10.1 Slope Fields

NOTES

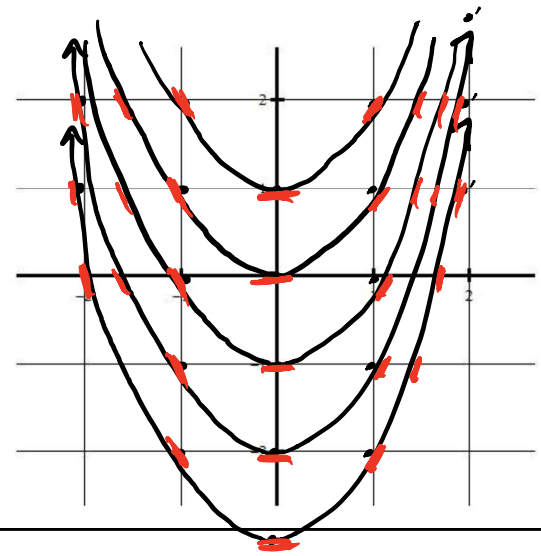
CALCULUS

Write your questions here!

Differential Equations = equation that involves a derivative

$$\frac{dy}{dx} = 2x \Rightarrow y = x^2 + C$$

x	y	$\frac{dy}{dx}$



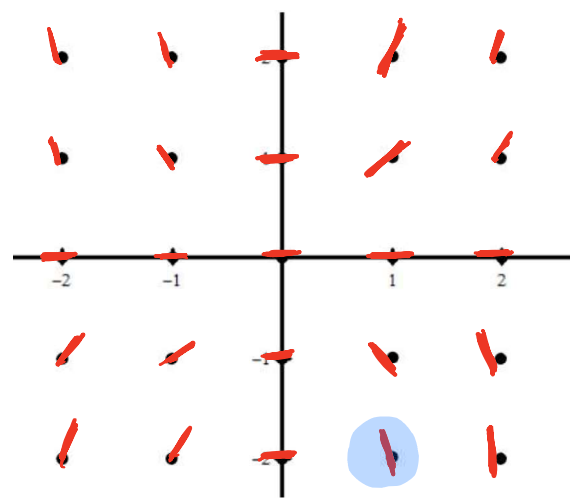
Create a Slope Field

$$\frac{dy}{dx} = xy$$

x	y	$\frac{dy}{dx}$
1	1	1
1	0	0
1	-1	-1
1	2	2
2	0	0

What is the slope at (1, -2)

$m = -2$



Create a Slope Field

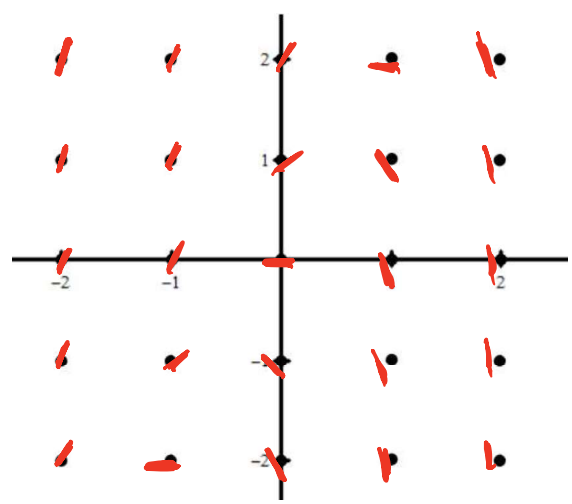
$$\frac{dy}{dx} = y - 2x$$

x	y	y'
2	2	-2

x	y	$\frac{dy}{dx}$
-2	2	6
-2	1	5
-2	0	4
-2	-1	3
-2	-2	2

x	y	$\frac{dy}{dx}$
-1	2	4
	1	3
	0	2
	-1	1
	-2	0

x	y	$\frac{dy}{dx}$
1	2	0
	1	-1
	0	-2
	-1	-3
	-2	-4

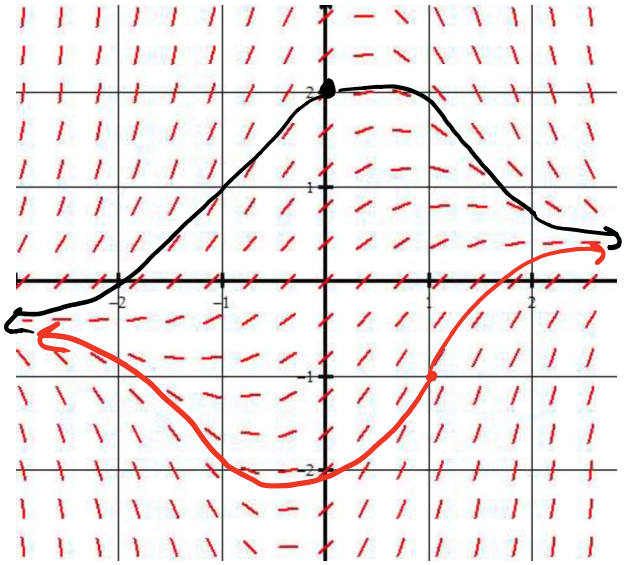


Let f be the function that satisfies the given differential equation. Write an equation for the tangent line to the curve $y = f(x)$ through the point $(1, -2)$.

$y - (-2) = -4(x - 1)$

Particular Solution

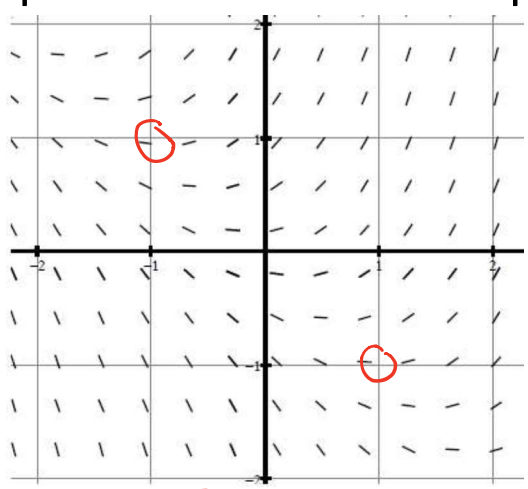
The figure below shows the slope for the differential equation $\frac{dy}{dx} = 1 - xy$



(A) Sketch the graph of a particular solution that contains $(0,2)$.

(B) Sketch the graph of a particular solution that contains $(1,-1)$.

Shown below is the slope field for which differential equation?



(A) $\frac{dy}{dx} = 1 + x$ (B) $\frac{dy}{dx} = x^2$ (C) $\frac{dy}{dx} = x + y$ (D) $\frac{dy}{dx} = \frac{x}{y}$ (E) $\frac{dy}{dx} = \ln y$

x	y	y'
-1		0

x	y'
0	0

x	y	y'
-1	1	0
1	-1	0

x	y'
0	0

y	y'
1	0

Maybe

SUMMARY:

Now, summarize your notes here!