

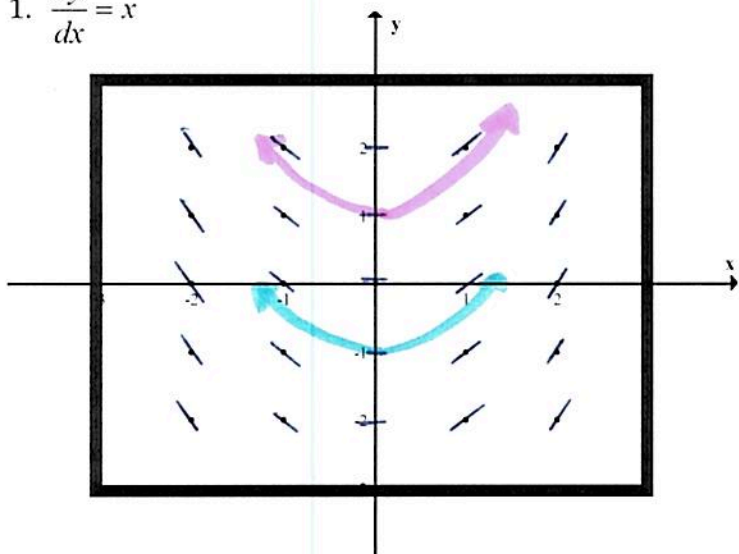
Calculus AB

Slope Fields

Draw a slope field for each of the following differential equations.

Name Key

1. $\frac{dy}{dx} = x$



x	y	dy/dx
0	0	0
all x=0		0
1	0	1
all x=1		1
-1	0	-1
all x=-1		-1
2	0	2
all x=2		2
-2	0	-2
all x=-2		-2

Sketch the solution curve through the point (0, 1).

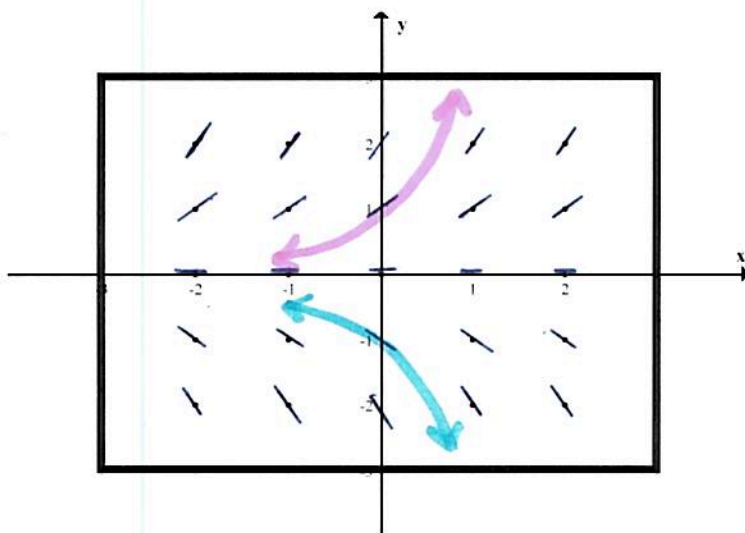
Sketch the solution curve through the point ((0, -1).

What parent function does this look like? $y = x^2$

$$\int dy = \int x dx$$

$$y = \frac{x^2}{2} + c$$

2. $\frac{dy}{dx} = y$



x	y	dy/dx
0	0	0
all y=0		0
0	1	1
all y=1		1
0	-1	-1
all y=-1		-1
0	2	2
all y=2		2
0	-2	-2
all y=-2		-2

Sketch the solution curve through the point (0, 1).

Sketch the solution curve through the point ((0, -1).

What parent function does this look like? $y = a^x$

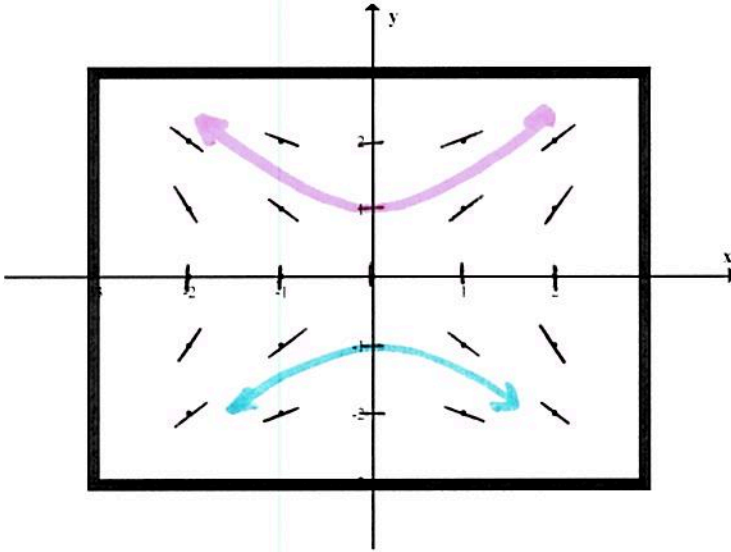
$$\int \frac{dy}{y} = \int dx$$

$$\ln|y| = x + c$$

$$e^{x+c} = y$$

$$y = Ce^x$$

3. $\frac{dy}{dx} = \frac{x}{y}$



x	y	dy/dx
0	0	und
all y = 0		und
all x = 0		0
1	1	1
2	2	1
-1	-1	1
-2	-2	1
1	-1	-1
2	1	2
2	-1	-2
1	2	1/2

Sketch the solution curve through the point (0, 1).

Sketch the solution curve through the point (0, -1).

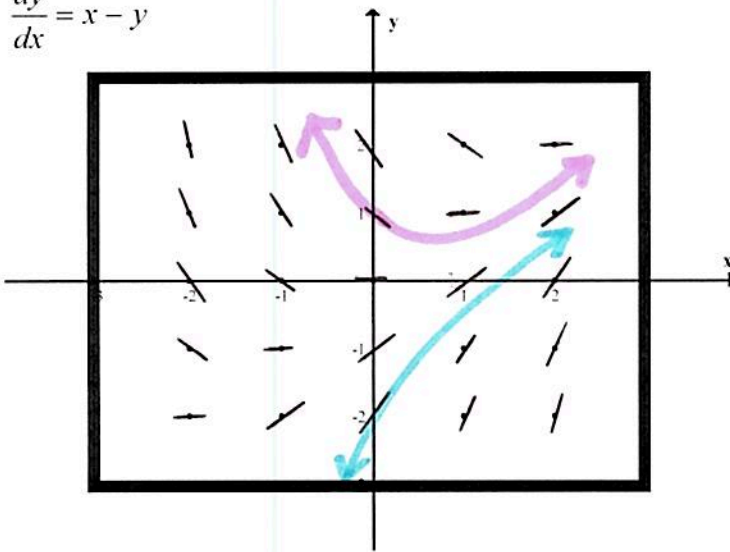
What parent function does this look like? *hyperbola*
 $y^2 - x^2 = 1$

$y dy = x dx$

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

$\frac{y^2}{2} - \frac{x^2}{2} = C \checkmark$

4. $\frac{dy}{dx} = x - y$



x	y	dy/dx
1	1	0
0	1	-1
1	0	1
2	0	2
-2	-1	-1
0	-1	1
-1	-2	1
2	1	1
-1	1	-2
-1	2	-3
0	2	-2
1	2	-1
1	-1	2

Sketch the solution curve through the point (0, 1).

Sketch the solution curve through the point (0, -2).

What parent function does this look like? ?

NOT SEPARABLE!