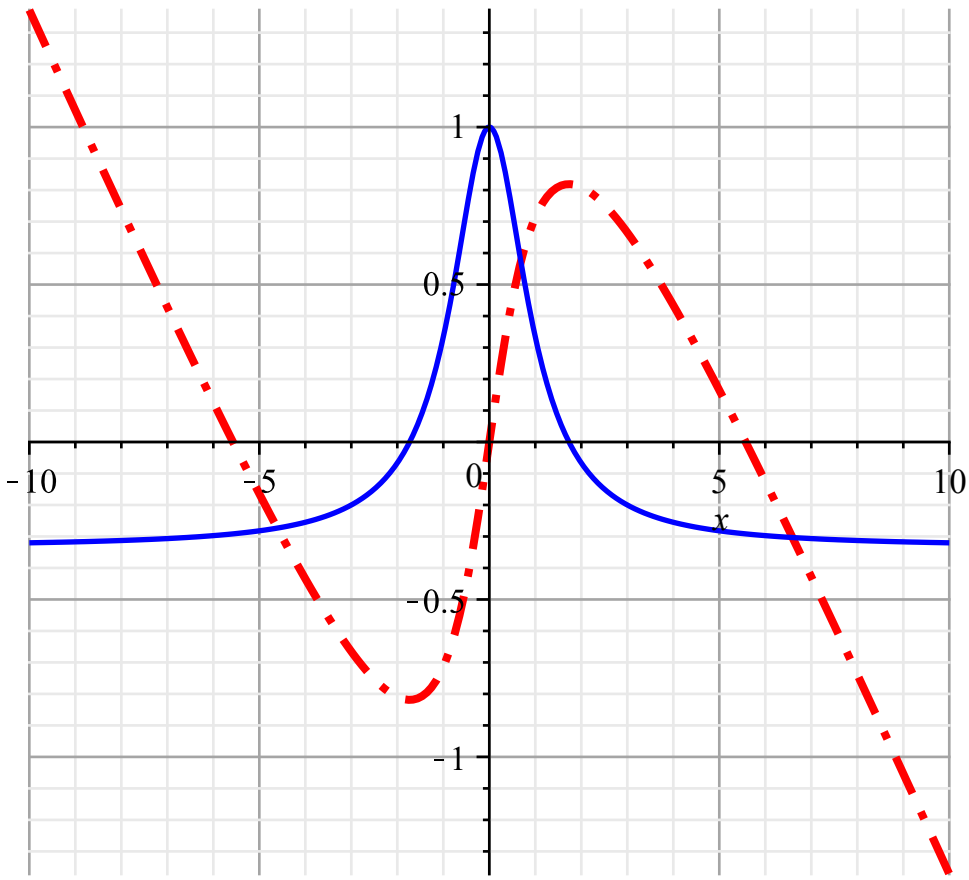
Examples

$$\frac{1-x^2}{1+x^2}$$

$$\frac{1-x^2}{1+x^2} \tag{1}$$

$$\frac{1-\frac{1}{3}x^2}{1+x^2} \xrightarrow{\text{integrate w.r.t. x}} -\frac{1}{3}x+\frac{4}{3}\arctan(x) \rightarrow$$



$$\int \frac{x^3-\frac{1}{3}x^2}{1+x^2}\,\mathrm{d}x$$

$$\frac{1}{2}x^2-\frac{1}{3}x-\frac{1}{2}\ln\left(1+x^2\right)+\frac{1}{3}\arctan(x) \tag{2}$$

$$\begin{bmatrix} -81 & -98 & -76 & -4 & 29 \\ -38 & -77 & -72 & 27 & 44 \\ -18 & 57 & -2 & 8 & 92 \\ 87 & 27 & -32 & 69 & -31 \\ 33 & -93 & -74 & 99 & 67 \end{bmatrix} \xrightarrow{\text{assign to a name}} MyMatrix$$

MyMatrix

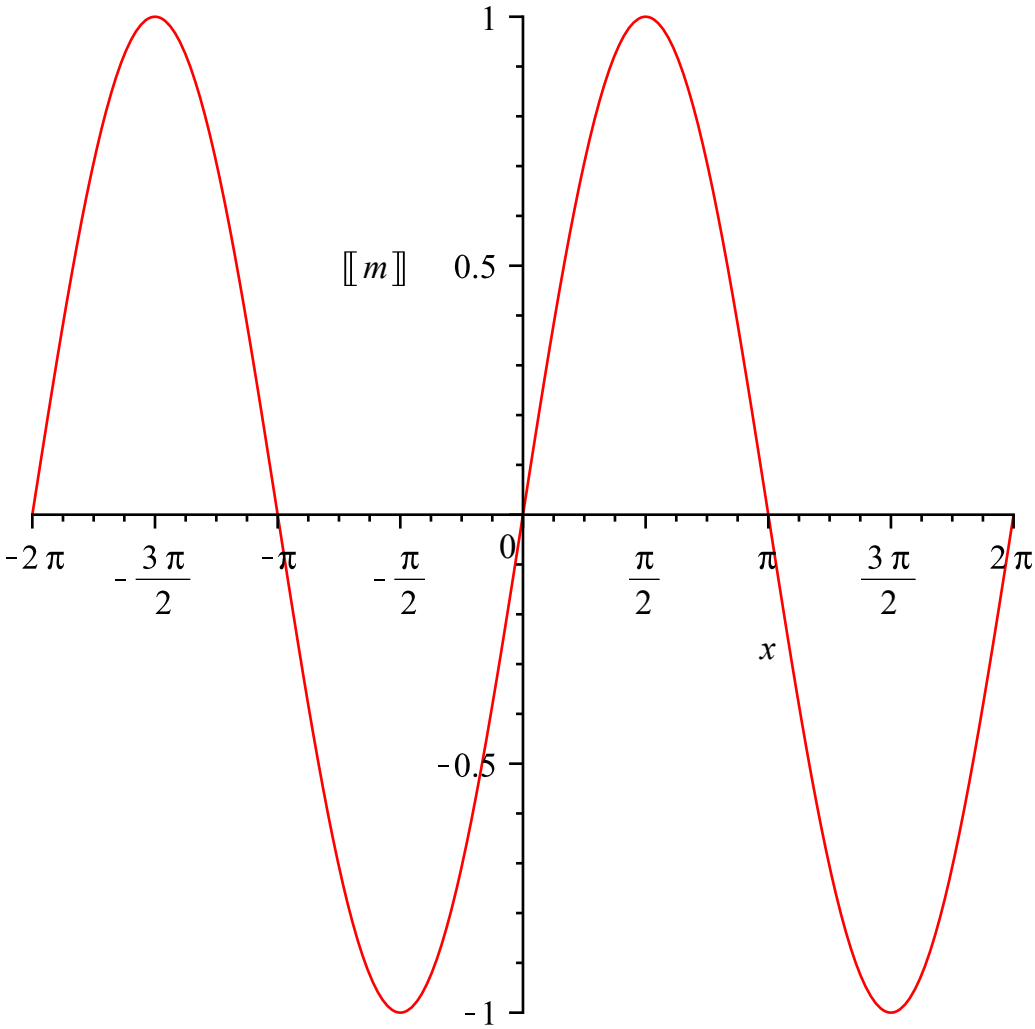
$$\begin{bmatrix} -81 & -98 & -76 & -4 & 29 \\ -38 & -77 & -72 & 27 & 44 \\ -18 & 57 & -2 & 8 & 92 \\ 87 & 27 & -32 & 69 & -31 \\ 33 & -93 & -74 & 99 & 67 \end{bmatrix} \tag{3}$$

$$\begin{bmatrix} 1 & k \\ k+1 & 3 \end{bmatrix} \xrightarrow{\text{characteristic polynomial}} \lambda^2 - 4\lambda + 3 - k^2 - k \xrightarrow{\text{evaluate at point}} \lambda^2 - 4\lambda - 3$$

$5 \cdot 5 = 25$

$\frac{d}{dx} x^2 + \sin(x) + 3 \cdot \cos(x) = 2x + \sin(x) + 3\cos(x)$

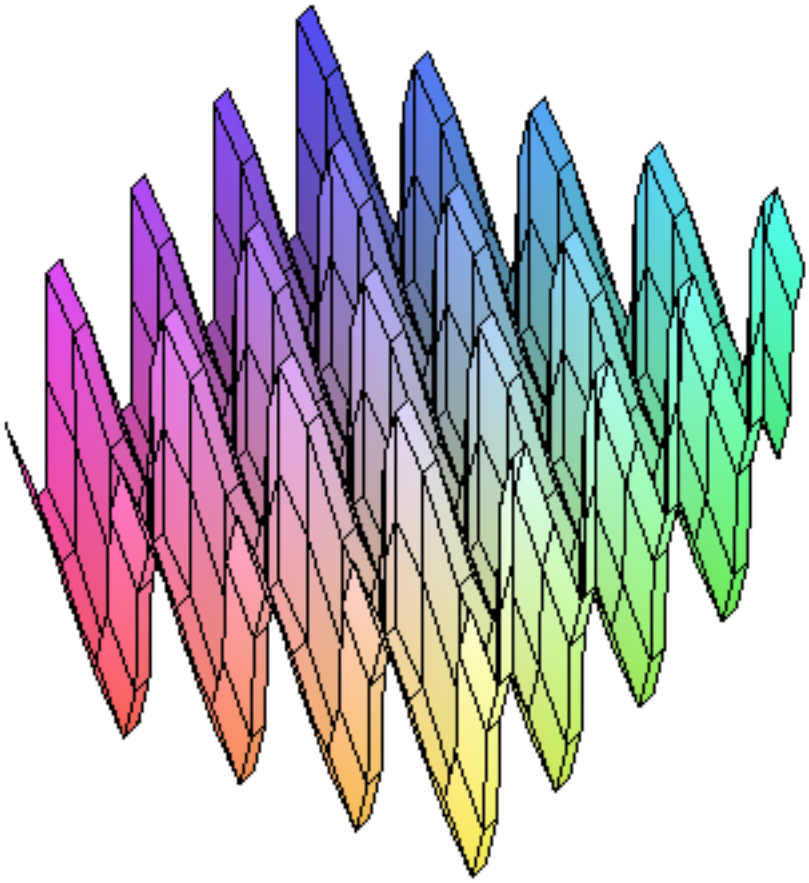
$\sin(x)[[m]] \rightarrow$



$$\sin(x\,z) + \cos(y\,z) \tag{4}$$

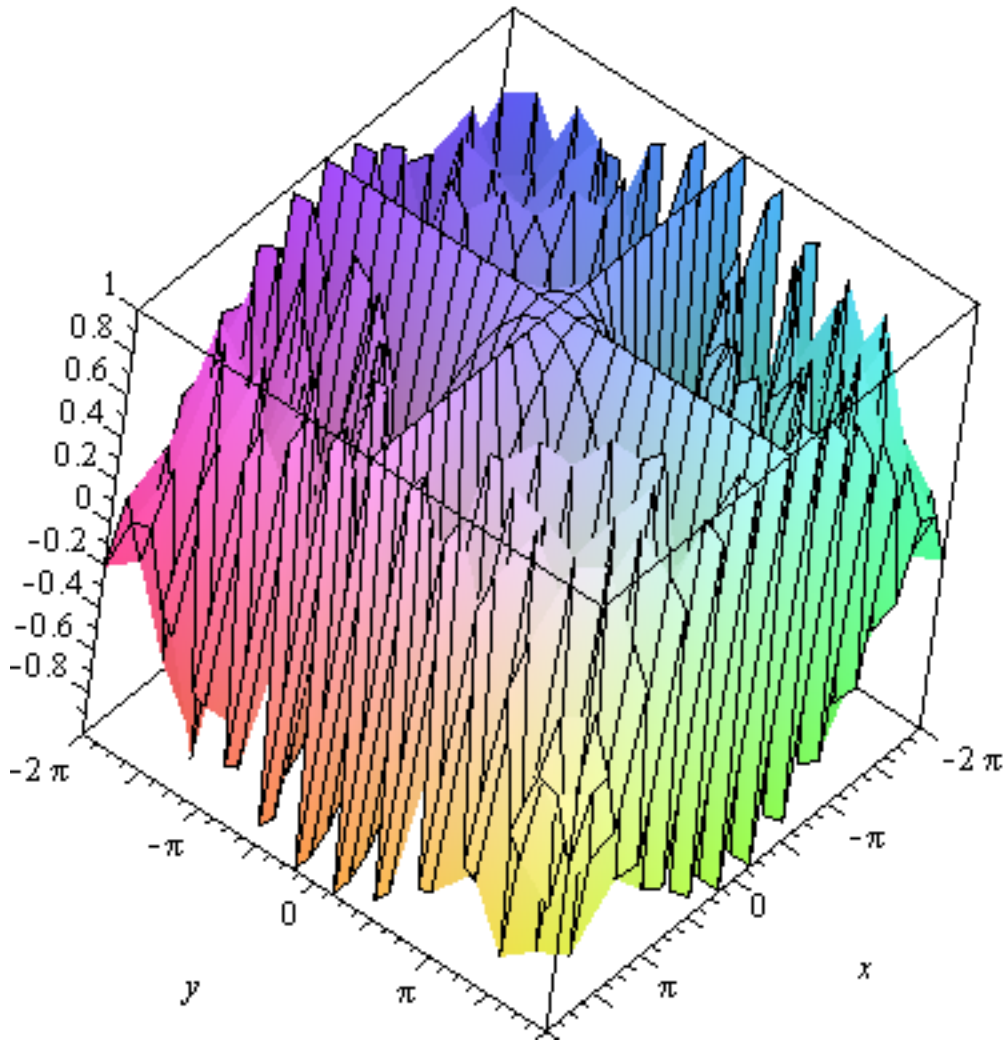
→

$z = -10.$



$\rightarrow$

$\cos(x \cdot y) \rightarrow$



Task Template, Assistants, Tutors

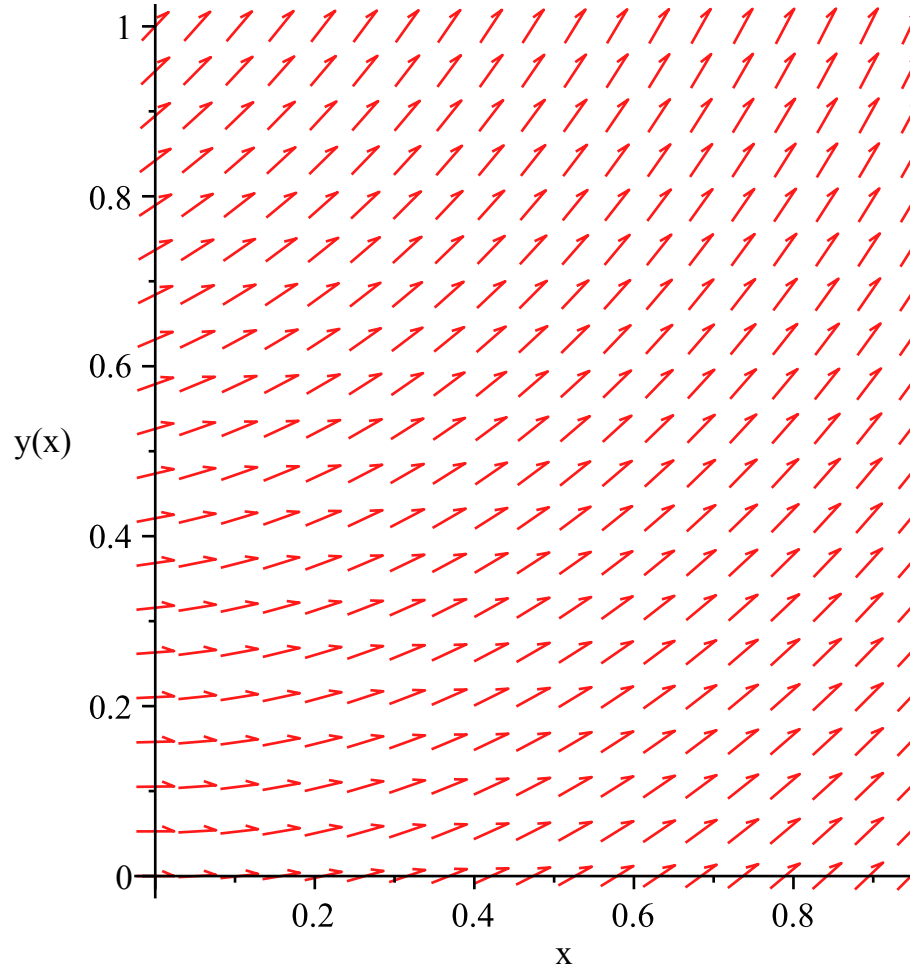
Task Template: Direction Field for the ODE $y' = f(x, y(x))$

Plot the direction field and solutions of an ODE.

Direction Field for the ODE $y' = f(x, y(x))$	
ODE	> $y' = x + y^2$ $\frac{d}{dx} y(x) = x + y(x)^2$
Set an x-range of the form $a..b$	> $0..1$ $0..1$
Set a y-range of the form $c..d$	> $0..1$ $0..1$
	>

Direction Field

> $DEtools[DEplot]((\mathbf{5}), y(x), x = (\mathbf{6}), y = (\mathbf{7}), linecolor = black)$



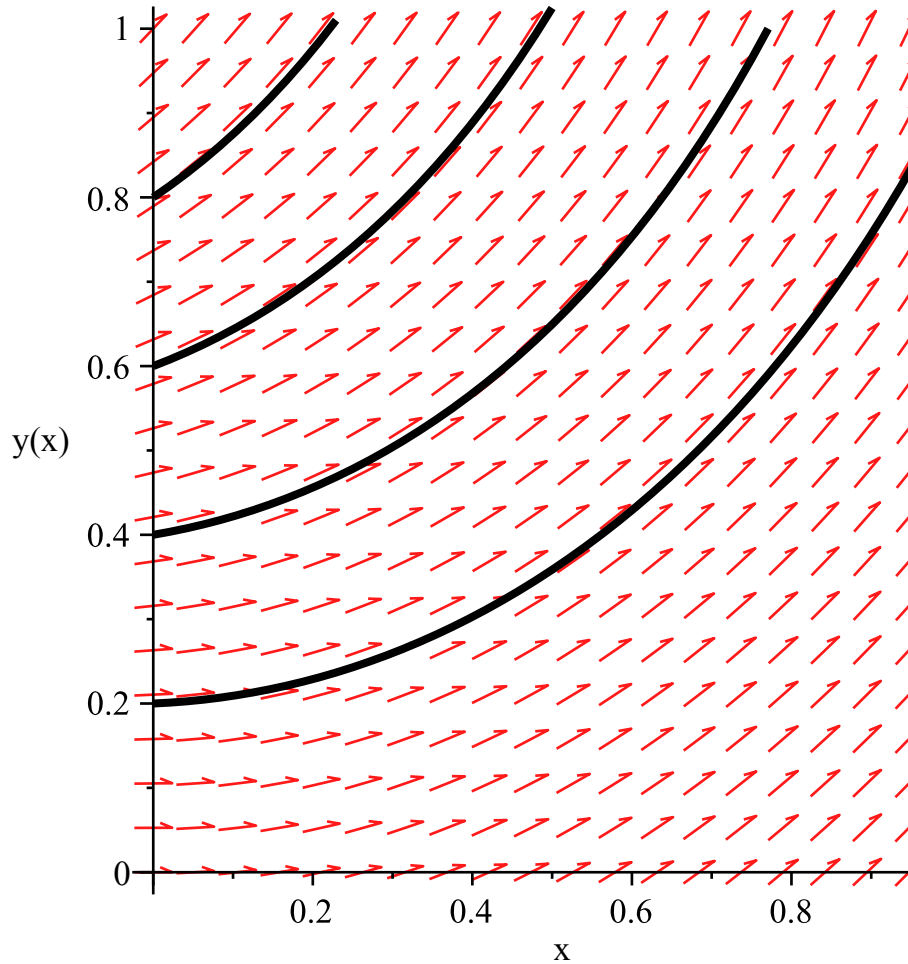
Initial Points

> $[[0, 0.2], [0, 0.4], [0, 0.6], [0, 0.8]]$

$$[[0, 0.2], [0, 0.4], [0, 0.6], [0, 0.8]]$$

Direction Field with Solutions

> $DEtools[DEplot]((\mathbf{5}), y(x), x = (\mathbf{6}), y = (\mathbf{7}), (\mathbf{8}), linecolor = black)$



Technical Documents

- Combining math and text
- Word-processing tools
- MapleCloud

Section 1

The limit of $\lim_{x \to 0} (\sin(x) + \cos(x))$ is 1 as you can see.

Interactive Components

- create data table

•

	1	2	3	4
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0

Resources

• Maple portal
• Maple Cloud