Direction Fields

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A worksheet to illustrate how to draw a direction field for an ODE.

> *restart*;

Load in DEtools package, which contains the helpful **DEplot** command.

> $with(DEtools)$:

A differential equation

> $de := u'(t) = t \cdot \cos(u(t)) - \sin(t)$

Sketch a direction field on the range 0 <= t <=5, 0 <= u <= 5 using the **DEplot** command.

> $DEplot(de, u(t), t = 0 ..5, u = 0 ..5)$

Same plot but with solution curves through initial conditions u(2) = 1 and u(4) = 2:

> $pp2 := DEplot(de, u(t), t = 0 ..5, u = 0 ..5, [[u(2) = 1], [u(4) = 2]], linecolor = black)$

>