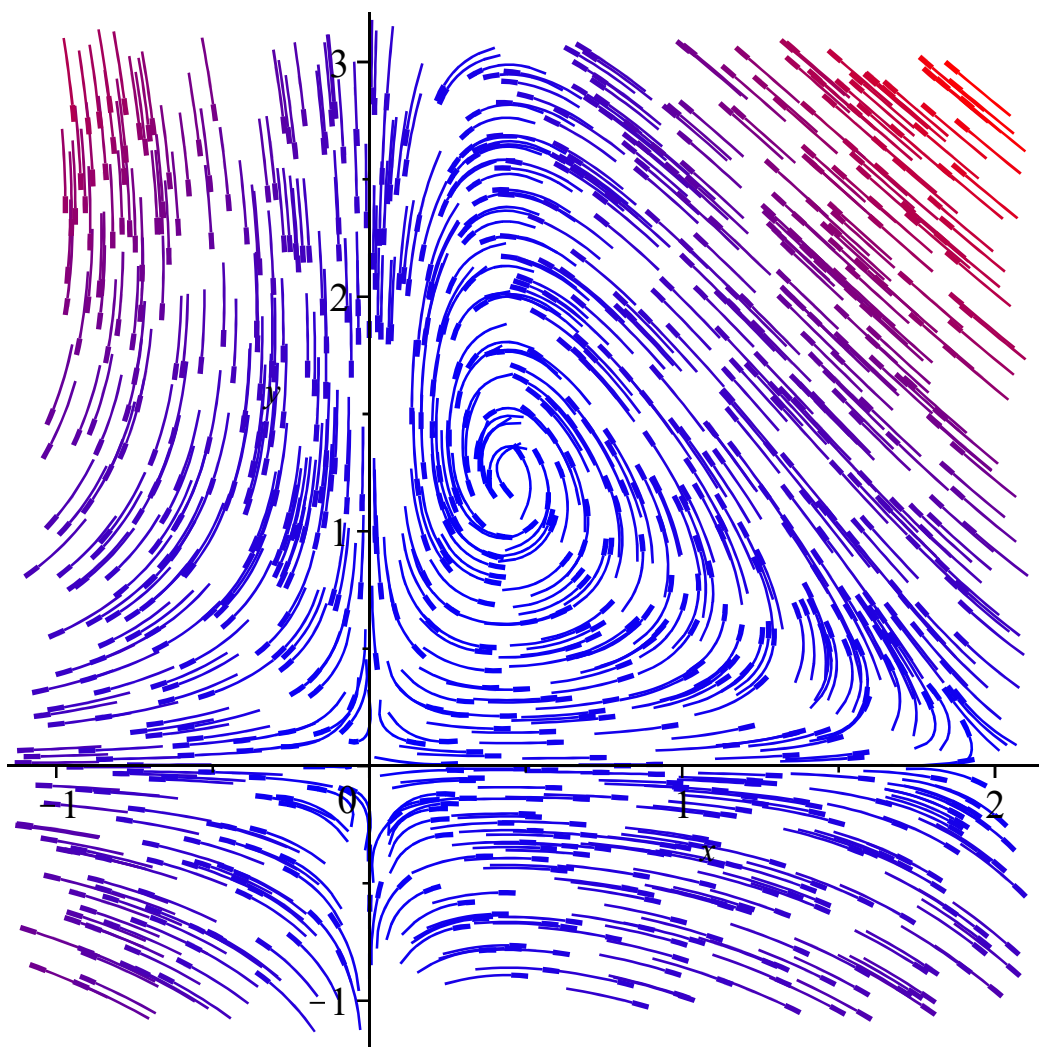> $d1 := diff(x(t), t) = 8 \cdot x(t) - 5 \cdot x(t) \cdot y(t) - 4 \cdot x(t) \cdot x(t)$

$$d1 := \frac{d}{dt} x(t) = 8\,x(t) - 5\,x(t)\,y(t) - 4\,x(t)^2 \tag{1}$$

> $d2 := diff(y(t), t) = -3 \cdot y(t) + 7 \cdot x(t) \cdot y(t)$

$$d2 := \frac{d}{dt} y(t) = -3\,y(t) + 7\,x(t)\,y(t) \tag{2}$$

> $solve(\{rhs(d1) = 0, rhs(d2) = 0\}, \{x(t), y(t)\})$

$$\{x(t) = 0, y(t) = 0\}, \{x(t) = 2, y(t) = 0\}, \left\{ x(t) = \frac{3}{7}, y(t) = \frac{44}{35} \right\} \tag{3}$$

> $with(DEtools):$
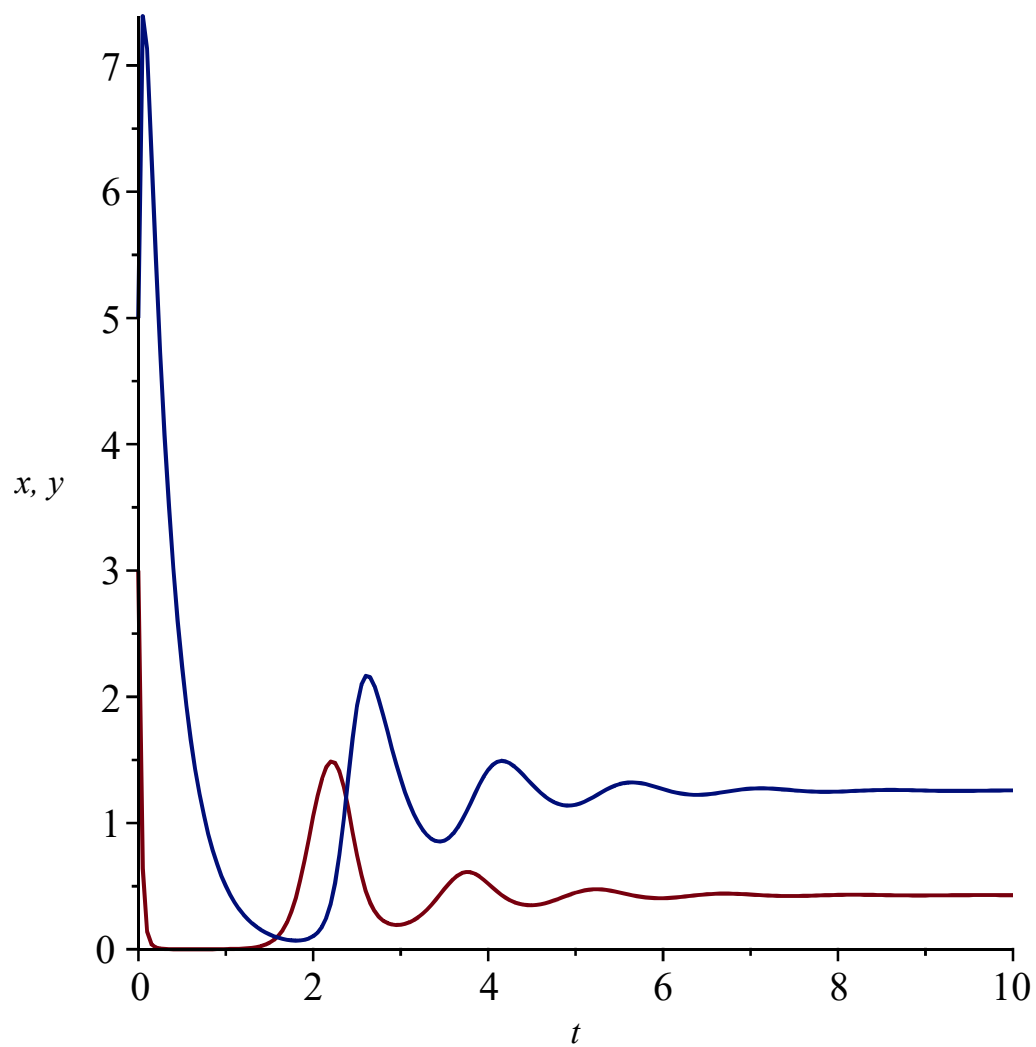> $DEplot([d1, d2], [x(t), y(t)], t = -10 .. 10, x = -1 .. 2, y = -1 .. 3, arrows = curve, dirfield = 1000,$
   $color = magnitude)$

> $syst1 := dsolve(\{d1, d2, x(0) = 3, y(0) = 5\}, \{x(t), y(t)\}, numeric, method = rkf45)$

$$syst1 := \mathbf{proc}(x\_rkf45) \ ... \ \mathbf{end\ proc} \tag{4}$$

> $with(plots):$
> $odeplot(syst1, [[t, x(t)], [t, y(t)]], t = 0 .. 10)$

> $syst2 := dsolve(\{d1, d2, x(0) = 5, y(0) = 3\}, \{x(t), y(t)\}, numeric, method = rkf45)$

$$syst2 := \textbf{proc}(x\_rkf45) \ \textbf{...} \ \textbf{end proc}$$

(5)

> $odeplot(syst2, [[t, x(t)], [t, y(t)]], t = 0..10)$
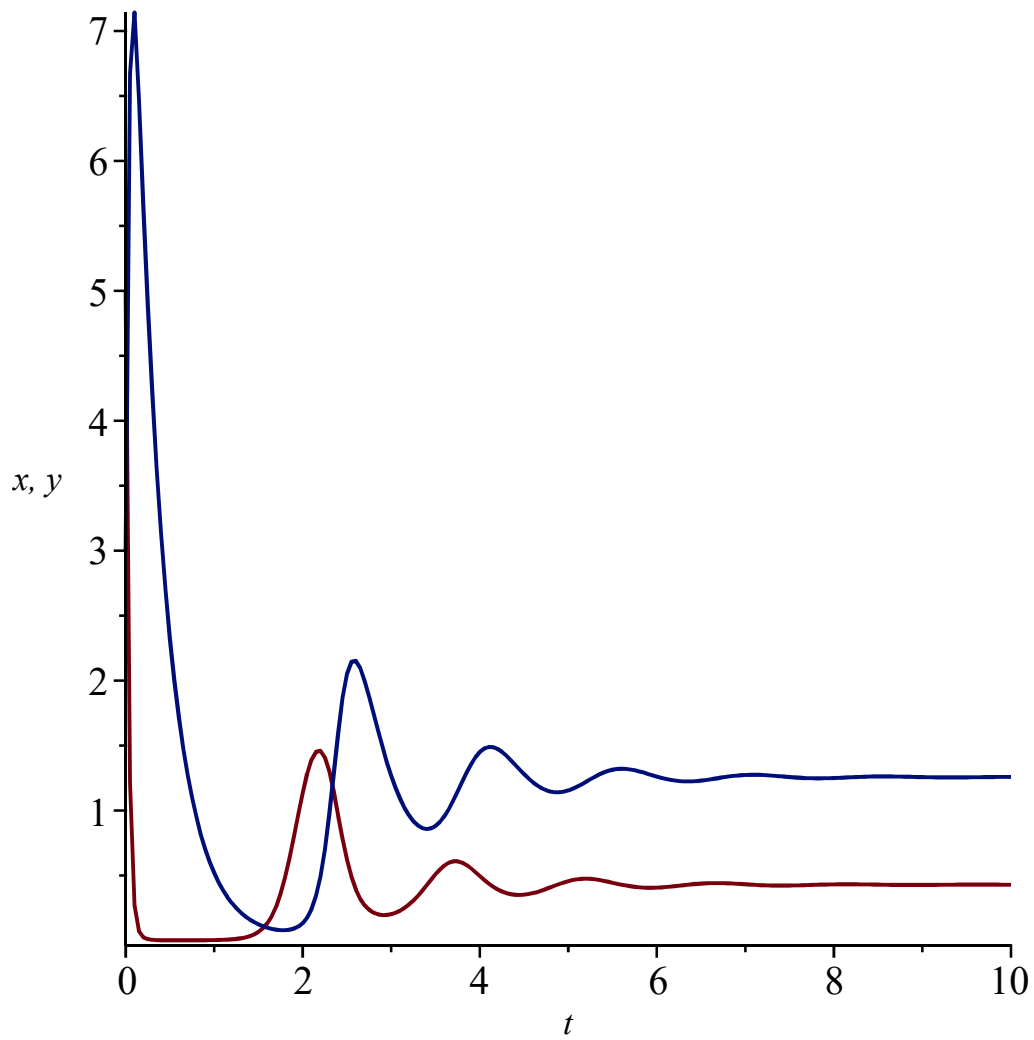
> $DEplot3d(\{d1, d2\}, \{x(t), y(t)\}, t = 0..10, x = -1..5, y = -1..5, [[x(0) = 1, y(0) = 1.5], [x(0) = 2, y(0) = 3]], scene = [t, x(t), y(t)], stepsize = 0.01, title = 'predator\ prey', linecolor = t)$

predator prey

>