```
> d1 := diff(x(t), t) = 0.8·x(t) - 0.5·x(t)·y(t) - 0.4·x(t)·x(t)
```

$$d1 := \frac{d}{dt}\,x(t) = 0.8\,x(t) - 0.5\,x(t)\,y(t) - 0.4\,x(t)^2 \qquad (1)$$

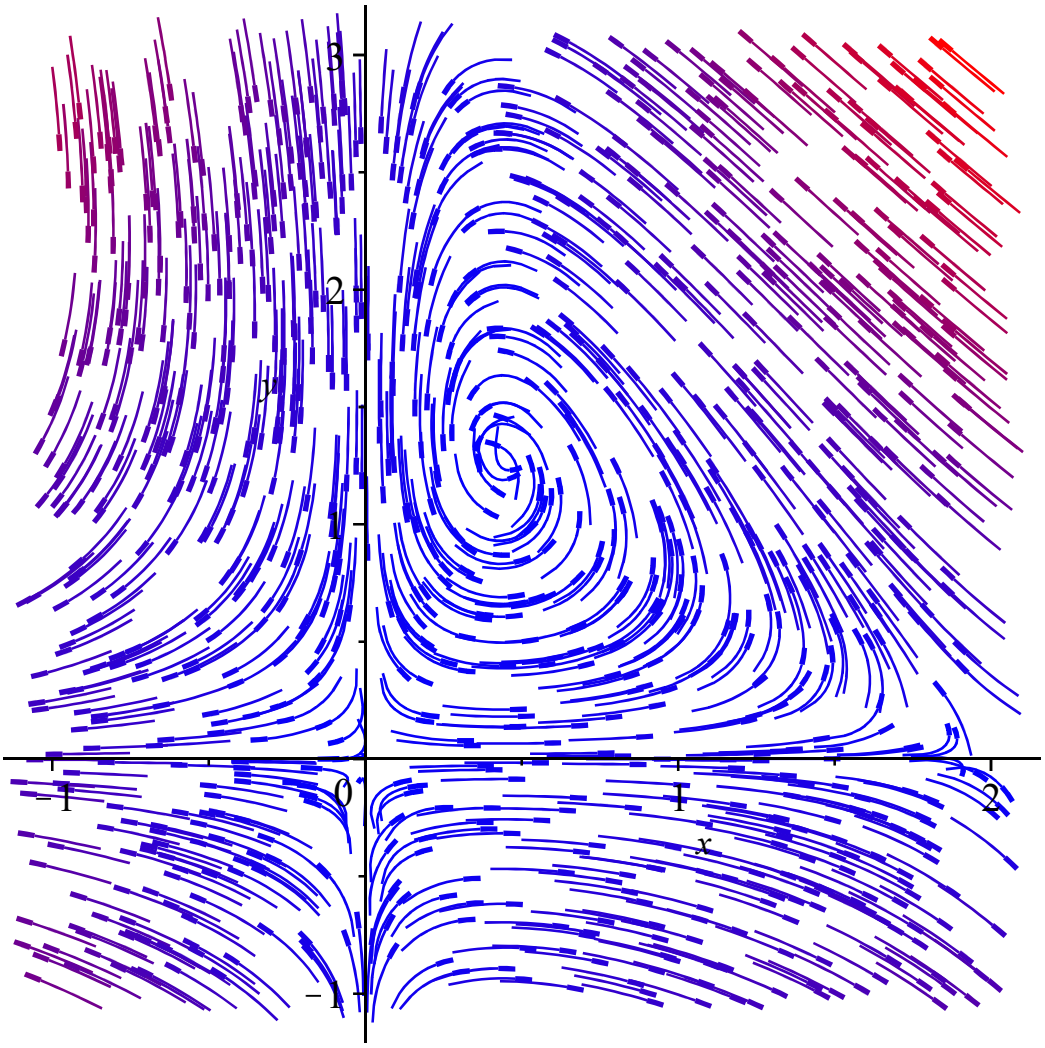
```
> d2 := diff(y(t), t) = -0.3·y(t) + 0.7·x(t)·y(t)
```

$$d2 := \frac{d}{dt}\,y(t) = -0.3\,y(t) + 0.7\,x(t)\,y(t) \qquad (2)$$

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

$$\{x(t) = 0., y(t) = 0.\}, \{x(t) = 2., y(t) = 0.\}, \{x(t) = 0.4285714286, y(t) = 1.257142857\} \qquad (3)$$

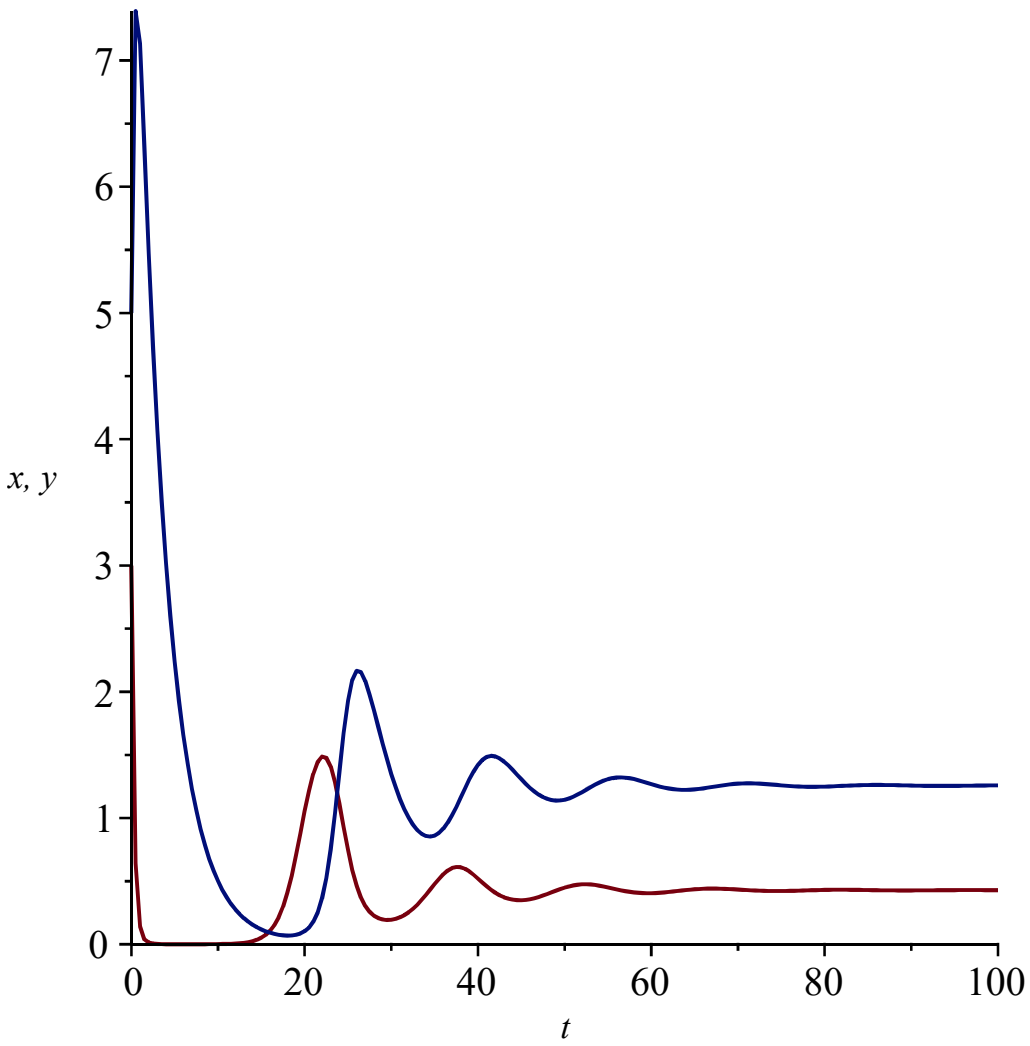
```
> with(DEtools) :
> DEplot([d1, d2], [x(t), y(t)], t = -10..10, x = -1..2, y = -1..3, arrows = curve, dirfield = 1000,
      color = magnitude)
```



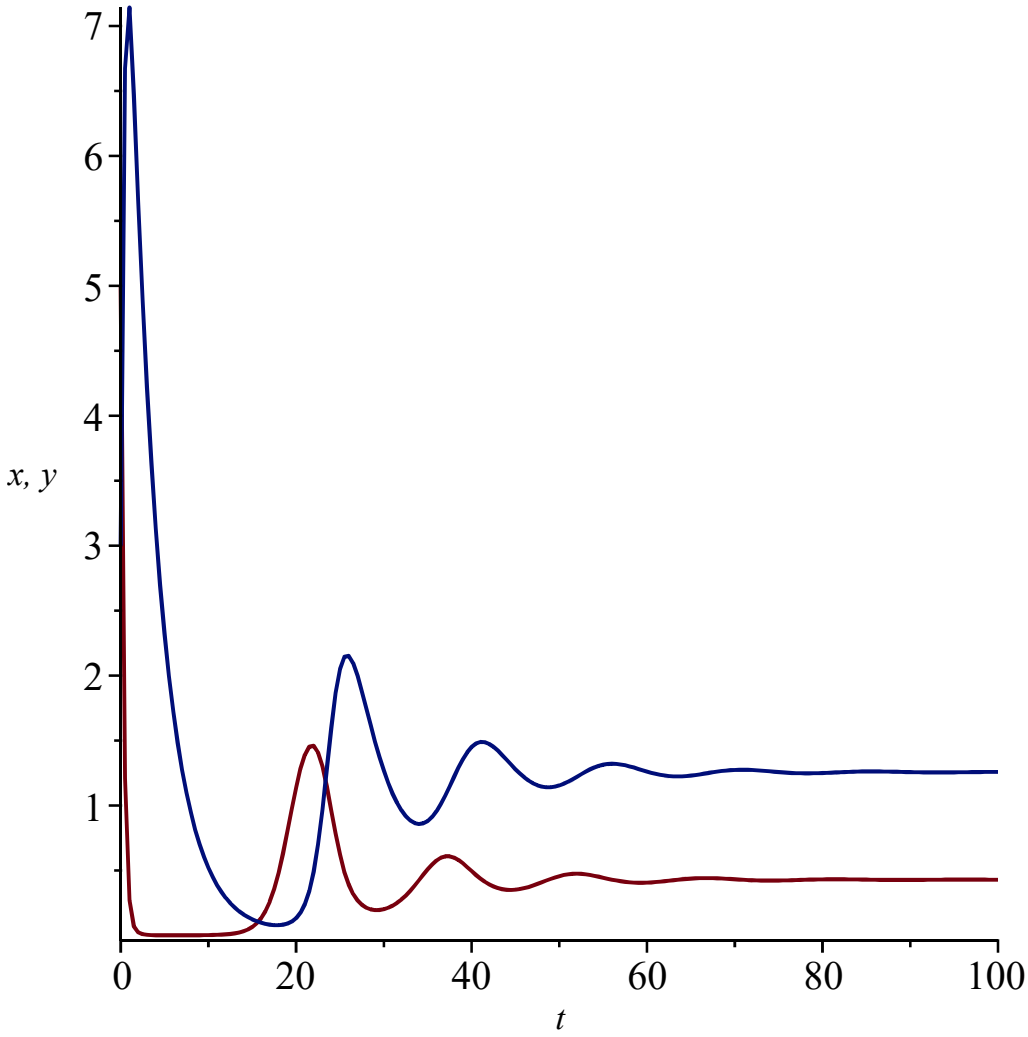

```
> syst1 := dsolve({d1, d2, x(0) = 3, y(0) = 5}, {x(t), y(t)}, numeric, method = rkf45)
```

$$syst1 := \mathbf{proc}(x\_rkf45)\ \ldots\ \mathbf{end\ proc} \qquad (4)$$

```
> with(plots) :
> odeplot(syst1, [[t, x(t)], [t, y(t)]], t = 0..100)
```

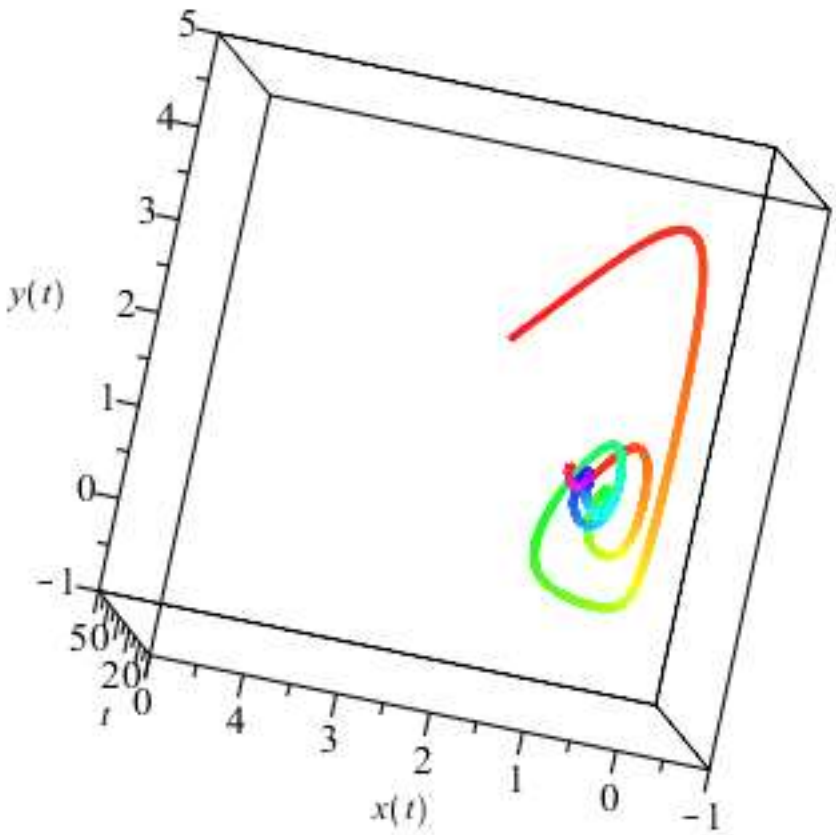



```
> syst2 := dsolve( {d1, d2, x(0) = 5, y(0) = 3}, {x(t), y(t)}, numeric, method = rkf45 )
                        syst2 := proc(x_rkf45) ... end proc                    (5)
> odeplot(syst2, [[t, x(t)], [t, y(t)]], t = 0..100)
```




```
> DEplot3d({d1, d2}, {x(t), y(t)}, t = 0..50, 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



>