

[O19-099

[> **restart;with(plots):**

[> **ed0:=diff(y(x),x\$2)-(diff(y(x),x))^2+y(x)*(diff(y(x),x))^3;**

$$ed0 := \left(\frac{d^2}{dx^2} y(x) \right) - \left(\frac{d}{dx} y(x) \right)^2 + y(x) \left(\frac{d}{dx} y(x) \right)^3$$

[> **s0:=dsolve(ed0,y(x));**

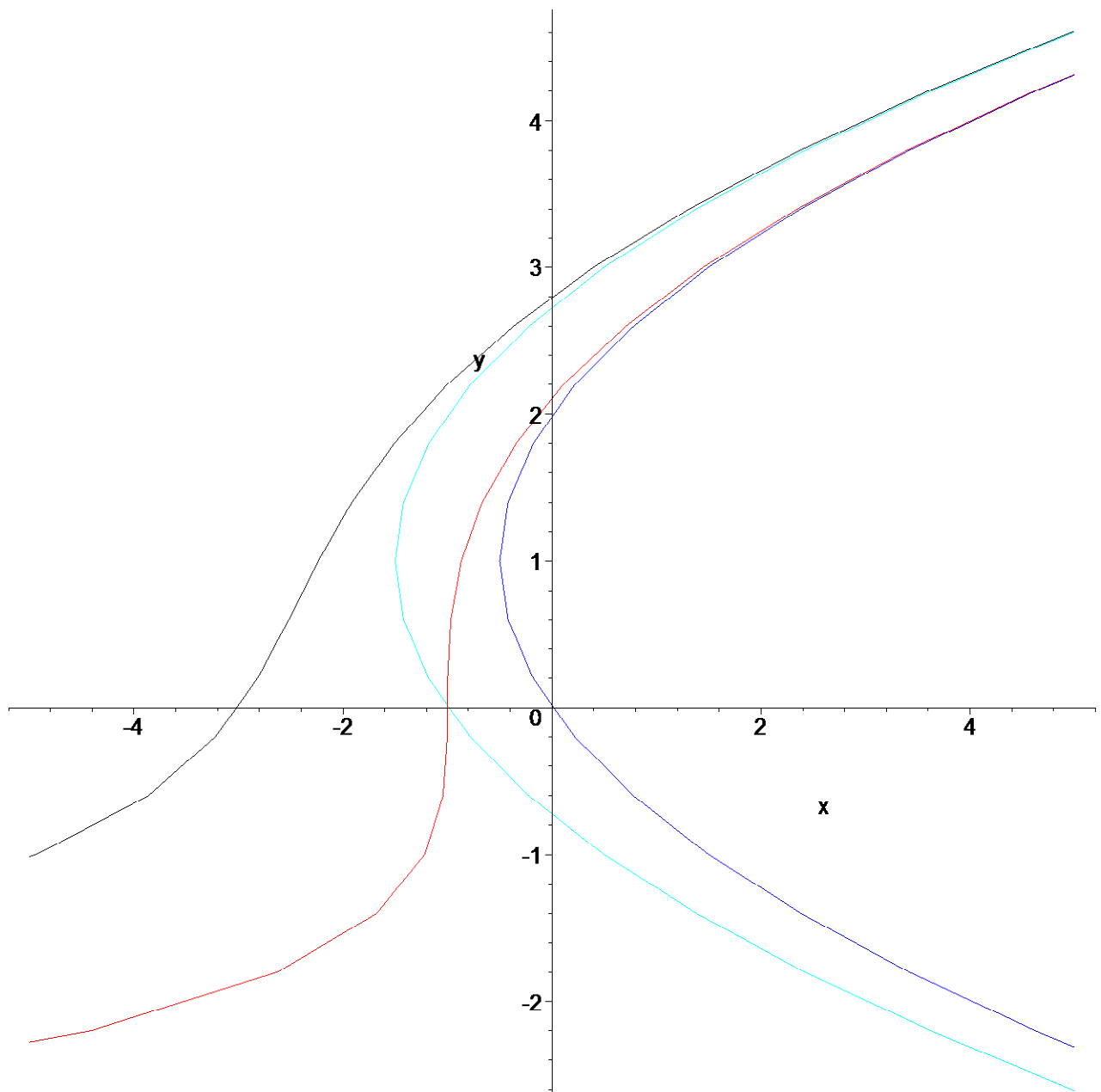
$$s0 := y(x) = _C1, -y(x) + \frac{1}{2} y(x)^2 - e^{(-y(x))} _C1 - x - _C2 = 0$$

[> **s00:=subs(y(x)=y,s0);s000:=unapply(s00,(_C1,_C2));**

$$s00 := -y + \frac{y^2}{2} - e^{(-y)} _C1 - x - _C2 = 0$$

$$s000 := (_C1, _C2) \rightarrow -y + \frac{y^2}{2} - e^{(-y)} _C1 - x - _C2 = 0$$

[> **implicitplot([s000(0,0),s000(1,0),s000(0,1),s000(2,1)],x=-5..5,y=-5..5,color=[blue, red,cyan,black]);**



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> ed:=diff(g(y),y)=g(y)-y*(g(y))^2;
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$$ed := \frac{d}{dy} g(y) = g(y) - y g(y)^2$$

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> s:=dsolve(ed,g(y));
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$$s := g(y) = \frac{1}{-1 + y + e^{(-y)} _C1}$$

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> a:=subs(s,g(y));b:=subs(y=y(x),a);
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$$a := \frac{1}{-1 + y + e^{(-y)} _C1}$$

$$b := \frac{1}{-1 + y(x) + e^{(-y(x))} _C1}$$

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> ed2:=diff(y(x),x)=b;
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$$ed2 := \frac{d}{dx} y(x) = \frac{1}{-1 + y(x) + e^{(-y(x))} _C1}$$

> **s2:=dsolve(ed2,y(x));**

$$s2 := x + y(x) - \frac{1}{2} y(x)^2 + e^{(-y(x))} _C1 + _C2 = 0$$

> **ed3:=diff(x(y),y)=-1+y+_C1*exp(-y);**

$$ed3 := \frac{d}{dy} x(y) = -1 + y + e^{(-y)} _C1$$

> **s3:=dsolve(ed3,x(y));**

$$s3 := x(y) = \frac{y^2}{2} - e^{(-y)} _C1 - y + _C2$$

> **cbe:=unapply(subs(s3,x(y)),(_C1,_C2));**

$$cbe := (_C1, _C2) \rightarrow \frac{y^2}{2} - e^{(-y)} _C1 - y + _C2$$

> **plot([cbe(0,0),cbe(1,0),cbe(0,1),cbe(-2,3)],y=-3..5,-5..5);**

