

$$\text{DSolve}[x y' [x] + 2 y[x] == \text{Sin}[x], y[x], x]$$

$$\left\{ \left\{ y[x] \rightarrow \frac{C[1]}{x^2} + \frac{-x \text{Cos}[x] + \text{Sin}[x]}{x^2} \right\} \right\}$$

$$\text{DSolve}\left[\left\{y' [x] == \frac{1}{E^{y[x]} - x}, y[1] == 0\right\}, y[x], x\right]$$

Solve::ifun :

Inverse functions are being used by Solve, so some solutions may not be found; use Reduce for complete solution information. >>

$$\left\{ \left\{ y[x] \rightarrow \text{Log}\left[x - \sqrt{-1 + x^2}\right] \right\}, \left\{ y[x] \rightarrow \text{Log}\left[x + \sqrt{-1 + x^2}\right] \right\} \right\}$$

$$\text{DSolve}[x y' [x] == \sqrt{1 - y[x]^2}, y[x], x]$$

$$\left\{ \left\{ y[x] \rightarrow 1 + 2 \text{Sinh}\left[\frac{1}{2} (C[1] + i \text{Log}[x])\right]^2 \right\} \right\}$$

$$\text{DSolve}\left[y' [x] == \frac{x - E^{-x}}{y[x] + E^{y[x]}}, y[x], x\right]$$

$$\left\{ \left\{ y[x] \rightarrow \text{InverseFunction}\left[e^{\#1} + \frac{\#1^2}{2} \&\right]\left[e^{-x} + \frac{x^2}{2} + C[1]\right] \right\} \right\}$$

$$\text{DSolve}[x + y[x] E^{-x} y' [x] == 0, y[0] == 1, y[x], x]$$

DSolve::bvnul : For some branches of the general solution, the given boundary conditions lead to an empty solution. >>

$$\left\{ \left\{ y[x] \rightarrow \sqrt{-1 + 2 e^x - 2 e^x x} \right\} \right\}$$

$$\text{DSolve}\left[y' [x] == \frac{a y[x] + b}{c x + d}, y[x], x\right]$$

$$\left\{ \left\{ y[x] \rightarrow -\frac{b}{a} + (d + c x)^{a/c} C[1] \right\} \right\}$$

$$\text{DSolve}\left[y' [x] == -\frac{a x + b y[x]}{b x + c y[x]}, y[x], x\right]$$

$$\left\{ \left\{ y[x] \rightarrow \frac{-b x - \sqrt{c e^{2 C[1]} + b^2 x^2 - a c x^2}}{c} \right\}, \left\{ y[x] \rightarrow \frac{-b x + \sqrt{c e^{2 C[1]} + b^2 x^2 - a c x^2}}{c} \right\} \right\}$$

$$\text{DSolve}[0 == E^x \text{Sin}[y[x]] + 3 y[x] + (3 (x + y[x]) + E^x \text{Cos}[y[x]]) y' [x], y[x], x]$$

$$\text{Solve}\left[e^x \text{Sin}[y[x]] + 3 x y[x] + \frac{3 y[x]^2}{2} == C[1], y[x]\right]$$