## Ex 1

1) $2y' + 3y = 0$

$$y_0(x) = K e^{-\frac{3}{2}x}$$

2) $y' + 2y = 0 \qquad (1y' + 2y = 0)$

$$y_0(x) = K e^{-\frac{2}{1}x} = K e^{-2x}$$

## Ex 2

1) $4y' + 5y = 0 \qquad y_0(x) = K e^{-\frac{5}{4}x}$

2) $2y' - 3y = 0 \qquad y_0(x) = K e^{-\frac{-3}{2}x} = K e^{3/2 x}$

## Ex 3

$y' + 2y = 6 \qquad f(x) = 3$

1) Si $f(x)$ est solution $\Rightarrow f' + 2f = 6$

Vérifier : $0 + 2 \times 3 = 6 \Rightarrow$ Vrai

Donc $f(x)$ est solution.

2) $y' + 2y = 0 \Rightarrow y_0(x) = K e^{-2x}$

3) $y(x) = Ke^{-2x} + 3$

Ex 4

$y' - y = x \qquad f(x) = -x - 1$

1) $f'(x) = -1$

$\hookrightarrow \; -1 - (-x-1) = -1 + x + 1 = x$

Donc $f(x)$ est bien solution

2) $y' - y = 0 \implies y_0(x) = Ke^{-\frac{-1}{1}x} = Ke^{x}$

3) $y(x) = Ke^{x} - x - 1$

Ex 5

$2y' + y = e^{x} \qquad f(x) = \frac{1}{3}e^{x}$

1) $f'(x) = \frac{1}{3}e^{x}$

$\hookrightarrow \; 2 \times \frac{1}{3}e^{x} + \frac{1}{3}e^{x} = \left(\frac{2}{3} + \frac{1}{3}\right)e^{x} = e^{x}$

Donc $f(x)$ est bien solution.

2) $2y' + y = 0 \Rightarrow y_0(x) = K e^{-\frac{1}{2}x}$

3) $y(x) = K e^{-\frac{1}{2}x} + \frac{1}{3} e^{x}$

<u>Ex 6</u>

$$y' + 3y = 5$$

1) Déterminer a tels que $f(x) = a$ soit solution.

$$\boxed{\begin{array}{c}\text{Si } f(x) \text{ est solution alors} \\ f' + 3f = 5\end{array}}$$

$f(x) = a \Rightarrow f'(x) = 0$

$\Rightarrow 0 + 3 \times a = 5$

$3a = 5 \Rightarrow \boxed{a = \frac{5}{3}}$

2) $y' + 3y = 0 \Rightarrow y_0(x) = K e^{-3x}$

$y(x) = K e^{-3x} + \frac{5}{3}$