

Correction DS BTS domotique Intégration - Jeudi 5 mars 2009

Guillaume CONNAN
<http://tehessin.tuxfamily.org>

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```
factor(dsolve(4*y''+12*y'+9*y=0,y))
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$$\frac{e^{-\frac{3}{2}x}(3xc_0 + 2xc_1 + 2c_0)}{2}$$

```
simplify(dsolve([4*y''+12*y'+9*y=36,y(0)=5,y'(0)=1/2],[x,y]))
```

$$[2xe^{-\frac{3}{2}x} + e^{-\frac{3}{2}x} + 4]$$

```
f(x) := (2*x+1)*exp(-3*x/2)+4
```

$$(x) \rightarrow (2x+1) \cdot \exp(-3x/2) + 4$$

```
limit(f(x),x=+infinity)
```

4

```
factor(diff(f(x),x))
```

$$\frac{-(6x+1)e^{-\frac{3x}{2}}}{2}$$

```
f(1/6)
```

$$\frac{4}{3} \cdot e^{-\frac{1}{4}} + 4$$

```
limit(f(x)-4,x=+infinity)
```

0

```
solve(f(x)-4>0,x)
```

$$\left[x > \left(\frac{-1}{2} \right) \right]$$

```
simplify(ibpu(2*x*exp(-3*x/2),2*x))
```

$$\left[\frac{-\left(4xe^{-\left(\frac{3}{2} \cdot x\right)}\right)}{3}, \frac{4e^{-\left(\frac{3}{2} \cdot x\right)}}{3} \right]$$

```
int(2*x*exp(-3*x/2),x,-1/2,3)
```

$$-\left(\frac{44}{9}e^{-\frac{9}{2}}\right) + \frac{2}{9}e^{\frac{3}{4}}$$

```
int(f(x)-4,x,-1/2,3)
```

$$-\left(\frac{50}{9}e^{-\frac{9}{2}}\right) + \frac{8}{9}e^{\frac{3}{4}}$$

```
graphe(f(x),x=-1/2..3,color=red)
```

