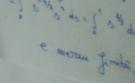
② 
$$\nabla(x_1y) = C(x^2 + y^2)$$
  
 $-\Delta \theta = 3$   
 $\nabla_{\mathbf{x}}(x_1y) = 2C \times \\ \nabla_{\mathbf{x}_{\mathbf{x}}}(x_1y) = 2C \times \\ \nabla_{\mathbf{y}}(x_1y) = 2C \times \\ \nabla_{\mathbf{$ 

$$\begin{array}{lll}
\Theta & P_{p} & \epsilon = 3 \times_{e} \in \mathbb{R} & \text{as } u(x_{e}) > 3 \\
\hline
\text{Fix } & \mathbb{R}_{1} := \left\{ \times \in \mathbb{R} \right\} u(x) > 3 \right\} \rightarrow \text{muside dim pp} \\
&= u^{2}\left( \left( 3, \infty \right) \right) - \text{dischiss} \\
\partial \mathcal{R}_{1} := \left\{ \times \in \mathcal{R} \right\} u(x) = 3 \right\} \\
\hline
\text{Fix } & \left[ w_{1} = + u + v \right], \text{ sinde } v = +\frac{3}{7} \left( x^{2} \cdot y^{2} \right)
\end{array}$$

$$\int_{0}^{\infty} |u|^{2} = |u|^$$



=) min 
$$(x) \le w(x,y) = -3 \le u - v = 0$$
  
=)  $-3 + v \le u$   
=)  $-3 + v \le u$ 

$$\Im(|x|) = w(x) = |x|_{-\frac{1}{2}}$$

$$\Im(|x|) + \frac{|x|}{r-1} \cdot \Im(|x|)$$

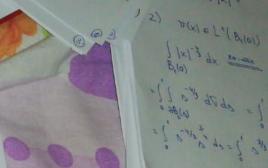
$$\partial_{1}(|x|) = \frac{d^{2}}{3^{2}} |x|_{-\frac{3}{2}\frac{3}{2}} = \frac{d^{2}}{3^{2}} |x|_{-\frac{3}{2}\frac{3}{2}}$$

$$\partial_{1}(|x|) = -\frac{3}{3} |x|_{-\frac{3}{2}\frac{3}{2}} = -\frac{3}{3} |x|_{-\frac{3}{2}\frac{3}{2}}$$

$$= \frac{h3}{30} |x|_{-13/3} + \frac{3}{3} |x|_{-\frac{1}{13}} = |x|_{-\frac{1}{13}} + \frac{h3}{30-63}$$

$$= \frac{h3}{30} |x|_{-13/3} + \frac{3}{3} |x|_{-\frac{1}{13}} = |x|_{-\frac{1}{13}} + \frac{h3}{30-63}$$

$$=\frac{35}{-35}\left|\times\right|^{-13/3}$$



e moren fin



 $Ex3) \begin{cases} \mu_{t} - 3\mu_{t} - 4\mu_{xx} = 0 \\ \mu(x, 0) = f(x) \\ \mu_{t}(x, 0) = g(x) \end{cases}$ 

1) sã re vein fice  $(\partial_t + \partial_x) \left( u_{\star} (x, t) - 4 u_{\star} (x, t) \right) =$   $= u_{tt} - 3 u_{tx} - 4 u_{xx}$ 

2) So x rez pb., H, cu 2 ec. de troxsport (omog si neomog)

3) t=0 diducifi sol u a pb mi cotul fex) = sin x  $119(x) = e^{-x}$  sau  $2e^{-x^2}$ Nu men stin exact.

 $E \times 41$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \\ u(x,0) = e^{-x^{2}} \end{cases}$   $\begin{cases} u(x,0) = e^{-x^{2}} \\ e^{t} \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{t}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{xx}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{xx}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{xx}(x,t) = 0. \end{cases}$   $\begin{cases} u_{t}(x,t) - u_{xx}(x,t) + u_{xx}(x,t) = 0. \end{cases}$ 

1)  $\phi = ?$  ec. coldwrii Pb. Cauchy verificata v,  $v(o, \frac{1}{2}) = ?$ 2)

2) Sol explicità a pb.

Fie 
$$w(s) = u(x-4s, t+s)$$
  
 $w'(s) = u_t(x-4s, t+s) + u_x(x-4s, t+s) \cdot (-4)$   
 $= u_t(x-4s, t+s) - 4u_x(x-4s, t+s) =$   
 $= g(x-4s+t+s) - 4f'(x-4s+t+s)$   
 $= g(x+t-3s) - 4f'(x+t-3s)$   
 $\int_0^{3s} w'(3)d3 = \int_0^{3s} g(x+t-3)d3 - 4\int_0^{3s} f'(x+t-3)d3$   
 $M_s = w(3s) - w(s) = u(x-12s, t+3s) - u(x+t)$ 

$$|au s = \frac{-t}{3}$$

$$M_s = u(x+yt,0) - u(x,t) = f(x+yt) - u(x,t)$$

# devine pt 
$$S = \frac{-t}{3}$$
 $f(x+4t) - u(x,t) = \int_{0}^{t} g(x+t-3)d3 - 4 \int_{0}^{t} f'(x+t-3)d3$ 

$$M(x,t) = f(x+y+t) - J_1 + {}^{4}J_2$$

$$J_2 = \int_0^t (-f(x+t-3))' d3 = -f(x+2+t) + f(x+t)$$

$$\int_{0}^{1} \int_{0}^{1} \int_{0$$

Deai, 
$$u(x,t) = f(x+yt) - 4f(x+zt) + 4f(x+t)$$
  
+  $\int_{x+t}^{x+zt} g(z)dz$ 

(Ex) v: 2 -> 2 v(x)=1x13 din ( |x1 . v n(x)) = ?

Si x go seeser P 31, v(x) E 4 (B,101)

So si goscasce p≥1, v(x)∈(, (R°B,(0))

Sa se goscasco un exemplu de fc. (-Du <0) pu m² ca dregita X+3y as fre o

 $u(x) = \left( \ln \frac{2}{|x|} \right)^{\frac{1}{2}}$  $-\Delta u(x) = \frac{u(x)}{4|x|^2 \ln^2(\frac{2}{|x|})}$ 

(Ex2) (Uxx (x,y) + 2 uyy (x,y) =0  $\int u(x,0) = u(x,1) = 0$   $\int u(x,0) = u(x,1) = 0$   $\int u(x,0) = u(x,1) = 0$ 1 (11y) = e-252Th Am (2 thy)

 $u(x,y) = A(x) \cdot B(y)$ 

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