



SON TESLİM TARİHİ: Çarşamba 16 Mart 2016 saat 12:00'e kadar.

NEW RULE: Poor quality photos of answers sent by email will no longer be accepted.

I prefer to receive your answers in hard copy. If you must email your answers, then you must either (1) prepare them with LaTeX; (2) use a word processor; (3) write them on paper, then use a proper flatbed scanner to scan them; or (4) write them on paper, then use a “scanner” app on your mobile phone to scan them. Make sure your name and student number are clearly visible on every page that you email.

Egzersiz 8 (General Solution).

- (a) [90p] Use a canonical form to find the general solution $u(x, y)$ to

$$u_{xx} + 2u_{xy} + u_{yy} - u = 7. \quad (1)$$

[HINT: Your final answer should be a function of x and y . I don't want to see ξ or η in your final answer.]

- (b) [10p] Calculate $(u_{xx} + 2u_{xy} + u_{yy} - u)$ for your solution, $u(x, y)$, to check that it really solves (1).

Ödev 3'ün çözümleri

6. We can integrate (wrt y) to see that $u_x = \int u_{xy} dy = \int xy dy = \frac{1}{2}xy^2 + f(x)$, and then integrate (wrt x) to see that $u = \int u_x dx = \int \frac{1}{2}xy^2 + f(x) dx = \frac{1}{4}x^2y^2 + F(x) + G(x)$ for some functions F and G .
7. (a) Since $\Delta = B^2 - 4AC = 25 - 4 \times 1 \times 4 = 9 > 0$, the PDE is hyperbolic. (b) $\frac{dy}{dx} = \frac{B \pm \sqrt{\Delta}}{2A} = \frac{5 \pm 3}{2} = 1, 4$. (c) $y = x + c$ and $y = 4x + c$. (d) omitted. (e) $u_{\eta\xi} = \frac{7}{9}(u_\xi + u_\eta) - \frac{1}{9} \sin\left(\frac{\eta - \xi}{3}\right)$