

Laboratory 5: Canonical form of second order PDE with two variables

Find the canonical form of the following PDE. In the case of hyperbolic equations find the general solution:

1. $u_{xx} - 4u_{yy} = 0;$

2. $4u_{xx} - 4u_{xy} - 2u_{yy} = 0;$

3. $u_{xx} + 5u_{xy} + 4u_{yy} = 0;$

4. $2u_{xx} - 4u_{xy} + 2u_{yy} = 0;$

5. $u_{xx} + u_{xy} + u_{yy} + u_x = 0;$

6. $u_{xx} + xu_{yy} = 0;$

7. $u_{xx} + x^2y^2u_{yy} = 0;$

8. $x^2u_{xx} + 4y^2u_{yy} = 0$