

Method of Characteristics - Practice Problems

Use the method of characteristics to solve the following initial value problems for $t > 0$ and $-\infty < x < \infty$.

1. $u_t + 4u_x = 0$, and $u(x, 0) = e^{x^2}$.
2. $u_t + (xt)u_x = 0$, and $u(x, 0) = 2x$.
3. $u_t + (x \sin t)u_x = 0$, and $u(x, 0) = 1/(1 + x^2)$.
4. $u_t - (tx^2)u_x = 0$, and $u(x, 0) = 1 + x$.
5. $u_t - u_x = xu$, and $u(x, 0) = 2x$.