

Exercise 3

Let u satisfy the diffusion equation $u_t = \frac{1}{2}u_{xx}$. Let

$$v(x, t) = \frac{1}{\sqrt{t}} e^{x^2/2t} u\left(\frac{x}{t}, \frac{1}{t}\right).$$

Show that v satisfies the “backward” diffusion equation $v_t = -\frac{1}{2}v_{xx}$ for $t > 0$. [TYPO: This should be u , not v .]