1. $\Delta u = \cos\varphi,\ r > 3,$
   $u(3,\varphi) = 3\sin 2\varphi.$
2. $\Delta u = 0,\ 0 < x < \pi,\ 0 < y < \frac{\pi}{2}$, если $u(0,y) = 0, u(\pi,y) = 0, u(x,0) = 0, u(x,\frac{\pi}{2}) = \sin 3x$
3. $\Delta u = 0, -\infty < x < \infty, -2\pi < y < 0; u(x,-2\pi) = 0,\ u(x,0) = 1,$ при $x < 1; u(x,0) = 0,$ при $x \geq 1$
4. $$\begin{cases} u_{tt} = u_{xx} - \sin 3x,\ t > 0,\ 0 < x < \frac{\pi}{2}; \\ u(0,t) = t, \quad u_x(\frac{\pi}{2},t) = 0, \\ u(x,0) = 2\sin 3x - \sin x, \\ u_t(x,0) = \sin x + 1. \end{cases}$$
5. $u_{tt} = 9u_{xx},\ 0 < x < \infty, t > 0$
   $u_x(0,t) = 0,\ u(x,0) = \begin{cases} \sin x, x \in [0;\pi] \\ 0, x \notin [0;\pi] \end{cases},\ u_t(x,0) = 0.$ Найти $u(\pi/4, t)$ и нарисовать график.
6. $u_{tt} = 4u_{xx}, t > 0, x > 0;$
   $u_x(0,t) = 0 \quad u(x,0) = \sin x \quad u_t(x,0) = 2\cos x.$

Описать процесс колебаний. Построить профиль струны в момент времени $t = \frac{\pi}{4}$.