Решить начальную задачу для однородного уравнения колебаний на бесконечной прямой:

1. $u_{tt} = u_{xx}, \quad u(x,0) = \cos 4x, \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [0,6] \\ 0, & x \notin [0,6] \end{cases}.$
2. $u_{tt} = u_{xx}, \quad u(x,0) = \sin 4x, \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [0,6] \\ 0, & x \notin [0,6] \end{cases}.$
3. $u_{tt} = 4u_{xx}, \quad u(x,0) = \cos 6x, \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [0,8] \\ 0, & x \notin [0,8] \end{cases}$
4. $u_{tt} = 4u_{xx}, \quad u(x,0) = \sin 6x, \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [0,8] \\ 0, & x \notin [0,8] \end{cases}.$
5. $u_{tt} = 9u_{xx}, \quad u(x,0) = \cos 8x, \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [0,2] \\ 0, & x \notin [0,2] \end{cases}.$
6. $u_{tt} = 9u_{xx}, \quad u(x,0) = \sin 8x, \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [0,2] \\ 0, & x \notin [0,2] \end{cases}.$
7. $u_{tt} = \frac{1}{4}u_{xx}, \quad u(x,0) = \cos 2x, \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [0,4] \\ 0, & x \notin [0,4] \end{cases}.$
8. $u_{tt} = \frac{1}{4}u_{xx}, \quad u(x,0) = \sin 2x, \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [0,4] \\ 0, & x \notin [0,4] \end{cases}.$
9. $u_{tt} = \frac{1}{9}u_{xx}, \quad u(x,0) = \cos x, \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [0,\pi] \\ 0, & x \notin [0,\pi] \end{cases}$
10. $u_{tt} = \frac{1}{9}u_{xx}, \quad u(x,0) = \sin x, \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [0,\pi] \\ 0, & x \notin [0,\pi] \end{cases}.$
11. $u_{tt} = u_{xx}, \quad u(x,0) = 1/(\operatorname{ch} 4x), \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [-6,0] \\ 0, & x \notin [-6,0] \end{cases}.$
12. $u_{tt} = u_{xx}, \quad u(x,0) = \operatorname{th} 4x, \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [-6,0] \\ 0, & x \notin [-6,0] \end{cases}.$
13. $u_{tt} = 4u_{xx}, \quad u(x,0) = 1/(\operatorname{ch} 6x), \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [-8,0] \\ 0, & x \notin [-8,0] \end{cases}.$
14. $u_{tt} = 4u_{xx}, \quad u(x,0) = \operatorname{th} 6x, \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [-8,0] \\ 0, & x \notin [-8,0] \end{cases}.$
15. $u_{tt} = 9u_{xx}, \quad u(x,0) = 1/(\operatorname{ch} 8x), \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [-2,0] \\ 0, & x \notin [-2,0] \end{cases}.$
16. $u_{tt} = 9u_{xx}, \quad u(x,0) = \operatorname{th} 8x, \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [-2,0] \\ 0, & x \notin [-2,0] \end{cases}.$
17. $u_{tt} = \frac{1}{4}u_{xx}, \quad u(x,0) = 1/(\operatorname{ch} 2x), \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [-4,0] \\ 0, & x \notin [-4,0] \end{cases}.$
18. $u_{tt} = \frac{1}{4}u_{xx}, \quad u(x,0) = \operatorname{th} 2x, \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [-4,0] \\ 0, & x \notin [-4,0] \end{cases}.$
19. $u_{tt} = \frac{1}{9}u_{xx}, \quad u(x,0) = 1/(\operatorname{ch} x), \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [-\pi,0] \\ 0, & x \notin [-\pi,0] \end{cases}.$
20. $u_{tt} = \frac{1}{9}u_{xx}, \quad u(x,0) = \operatorname{th} x, \quad u_t(x,0) = \begin{cases} \exp(-x^2), & x \in [-\pi,0] \\ 0, & x \notin [-\pi,0] \end{cases}.$

(в ответе использовать функцию ошибок: $\operatorname{erf}(w) \equiv \Phi(w) \equiv \frac{2}{\sqrt{\pi}} \int_0^w \exp(-z^2)\, dz$ )