

$$\begin{aligned}u_t &= 5u_{xx} \\u(0, t) &= u(3, t) = 0 \\u(x, 0) &= f(x)\end{aligned}$$

1.  $f(x) = 7 \sin \frac{\pi x}{3}$

2.  $f(x) = 4 \sin \frac{\pi x}{3} - 2 \sin \frac{2\pi x}{3} - \pi \sin \pi x$

3.  $f(x) = 6 \sin \frac{7\pi x}{3}$

4.  $f(x) = -2 \sin 3\pi x$

5.  $f(x) = \sum_1^{30} n \sin \frac{n\pi x}{3}$

6.  $f(x) = \sum_1^{23} \frac{1}{n^2} \sin \frac{2n\pi x}{3}$

7.  $f(x) = \sum_1^{51} e^n \sin n\pi x$

8.  $f(x) = \sum_1^{104} \frac{1}{n!} \sin 2n\pi x$