

$$1. \quad u = 7e^{-\left(\frac{\pi\sqrt{5}}{3}\right)^2 t} \sin \frac{\pi x}{3}$$

$$2. \quad u = 4e^{-\left(\frac{\pi\sqrt{5}}{3}\right)^2 t} \sin \frac{\pi x}{3} - 2e^{-\left(\frac{2\pi\sqrt{5}}{3}\right)^2 t} \sin \frac{2\pi x}{3} - \pi e^{-(\pi\sqrt{5})^2 t} \sin \pi x$$

$$3. \quad u = 6e^{-\left(\frac{7\pi\sqrt{5}}{3}\right)^2 t} \sin \frac{7\pi x}{3}$$

$$4. \quad u = -2e^{-(3\pi\sqrt{5})^2 t} \sin 3\pi x$$

$$5. \quad u = \sum_1^{30} n e^{-\left(\frac{n\pi\sqrt{5}}{3}\right)^2 t} \sin \frac{n\pi x}{3}$$

$$6. \quad u = \sum_1^{23} \frac{1}{n^2} e^{-\left(\frac{2n\pi\sqrt{5}}{3}\right)^2 t} \sin \frac{2n\pi x}{3}$$

$$7. \quad u = \sum_1^{51} e^n e^{-(n\pi\sqrt{5})^2 t} \sin n\pi x$$

$$8. \quad u = \sum_1^{104} \frac{1}{n!} e^{-(2n\pi\sqrt{5})^2 t} \sin 2n\pi x$$