Решить задачу об остывании однородного шара $u_t = a^2\,\Delta u$:

1. $a = 1,\quad u(3,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 5r^2\sin^2\theta\sin 2\varphi.$
2. $a = 2,\quad u(4,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 6r^2\sin^2\theta\cos 2\varphi.$
3. $a = 3,\quad u(7,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 9r^2\sin\theta\cos\theta\sin\varphi.$
4. $a = 1/2,\quad u(6,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 8r^2\sin\theta\cos\theta\cos\varphi.$
5. $a = 1/3,\quad u(1,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 7r^3\sin^2\theta\cos\theta\sin 2\varphi.$
6. $a = 1,\quad u(2,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 4r^3\sin^2\theta\cos\theta\cos 2\varphi.$
7. $a = 2,\quad u(5,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 9r\sin\theta\sin\varphi.$
8. $a = 3,\quad u(2,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 6r\sin\theta\cos\varphi.$
9. $a = 1/2,\quad u(3,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 7r^3\sin^3\theta\sin 3\varphi.$
10. $a = 1/3,\quad u(4,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 8r^3\sin^3\theta\cos 3\varphi.$
11. $a = 1,\quad u(5,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 3r^2\sin^2\theta\cos 2\varphi.$
12. $a = 2,\quad u(6,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 4r^2\sin^2\theta\sin 2\varphi.$
13. $a = 3,\quad u(9,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 7r^2\sin\theta\cos\theta\cos\varphi.$
14. $a = 1/2,\quad u(8,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 6r^2\sin\theta\cos\theta\sin\varphi.$
15. $a = 1/3,\quad u(7,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = r^3\sin^2\theta\cos\theta\cos 2\varphi.$
16. $a = 1,\quad u(4,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 2r^3\sin^2\theta\cos\theta\sin 2\varphi.$
17. $a = 2,\quad u(9,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 5r\sin\theta\cos\varphi.$
18. $a = 3,\quad u(6,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 2r\sin\theta\sin\varphi.$
19. $a = 1/2,\quad u(7,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 3r^3\sin^3\theta\cos 3\varphi.$
20. $a = 1/3,\quad u(8,\theta,\varphi,t) = 0,\quad u(r,\theta,\varphi,0) = 4r^3\sin^3\theta\sin 3\varphi.$