

习题 7.2

1. $4a^{\frac{7}{3}}$; 2. (1) πa^3 ; (2) $\frac{2}{3}\pi R^3$; 3. $\int_{\Gamma} Pdx + Qdy + Rdz = \int_{\Gamma} \frac{P + 2xQ + 3yR}{\sqrt{1 + 4x^2 + 9y^2}} ds$;

4. $-2\sqrt{3}\pi a^2$; 5. $\frac{3k\pi}{16}a^2$; 6. 0; 7. $1 + e^{-1}$; 8. 9; 9. $\frac{\pi}{2}(b-a)a^2 + 2a^2b$;

11. $Q(x, y) = x^2 + 2y - 1$; 12. $\lambda = 3$; $-15\frac{4}{5}$; 13. $a = b = -1$; $u(x, y) = \frac{x-y}{x^2+y^2}$;

14. $2\pi R^2$; 15. $\frac{64}{15}\sqrt{2}a^4$; 16. $\frac{\pi}{2}a^4 \cos^2\alpha \sin\alpha$; 17. $c\pi R^2 + 2\pi R^3$;

18. $4\pi ab\left(\frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2}\right)$; 19. $\frac{1}{2}$; 20. $4\pi R^4$; 21. 34π ; 22. $\frac{93}{5}\pi(2 - \sqrt{2})$; 23. $-\frac{9}{2}$;

24. -3π ; 25. 0.