

第一章 函数

1. (1) B; (2) C; (3) A; (4) A; (5) D; (6) B;
 (7) A; (8) D; (9) B; (10) C; (11) C; (12) C;
 (13) B; (14) A; (15) D; (16) C; (17) B; (18) B;
 (19) C; (20) A; (21) C; (22) C; (23) C; (24) A;
 (25) B; (26) A; (27) B; (28) D; (29) C.

2. (1) $(-\frac{\pi}{2}, \frac{\pi}{2})$; (2) $[1, +\infty)$; (3) $[1, +\infty)$;

- (4) $[-4, 3) \cup (3, 4]$; (5) $[1, +\infty)$; (6) $x^2 - 6x + 10$;

- (7) $\frac{1+2x}{5+x}$; (8) $y = x^3 - 1$; (9) $[-1, 1]$;

- (10) $[0, \pi]$; (11) $y = u^3, u = \sin v, v = 3x + 2$;

- (12) $[0, +\infty)$; (13) $y = \ln u, u = \arcsin v, v = x - 1$;

- (14) $x^2 - 2x + 2$; (15) 4^{2x-1} ; (16) 6.

3. (1) 错误; (2) 正确; (3) 正确; (4) 错误; (5) 正确; (6) 正确;
 (7) 正确; (8) 错误; (9) 正确; (10) 正确; (11) 错误; (12) 错误;
 (13) 错误; (14) 正确; (15) 正确; (16) 正确; (17) 正确; (18) 错误;
 (19) 错误; (20) 错误; (21) 正确; (22) 错误;

4. (1) 不是同一函数; (2) 是同一函数; (3) 是同一函数;
 (4) 是同一函数; (5) 不是同一函数.

5. $f(0) = 0, f(2) = -8, f(-x+1) = -\frac{2(x^2 - 2x + 1)}{x+2}$.

6. $x \in \mathbb{R}$.

7. $[1, 3]$.

8. $[2, 3]$.

9. (1) 偶函数; (2) 非奇非偶函数.

10. (1) 偶函数; (2) 偶函数; (3) 奇函数;
 (4) 奇函数; (5) 偶函数; (6) 奇函数.

11. (1) $T = 2\pi$; (2) $T = \pi$; (3) $T = \pi$;

(4) $T = \frac{\pi}{3}$.

12. (1) $y = u^{10}, u = 3x + 2$; (2) $y = \sqrt{u}, u = 1 - x^2$; (3) $y = 10^u, u = -x$;

- (4) $y = 2^u, u = x^2$; (5) $y = \log_2 u, u = x^2 + 1$; (6) $y = \sin u, u = 5x$;

$$(7) y = \sin u, u = x^5; \quad (8) y = u^5, u = \sin x; \quad (9) y = \lg u, u = \lg v, v = \lg x;$$

$$(10) y = \arcsin u, u = \frac{x}{2}; \quad (11) y = \sin u, u = 2x; \quad (12) y = u^2, u = 2x + 3;$$

$$(13) y = u^{100}, u = 5 - x^2; \quad (14) y = \ln u, u = \sin v, v = 2^w, w = x + 1;$$

$$(15) y = \cos u, u = v^2, v = e^x - 1; \quad (16) y = u^2, u = \cos v, v = \ln w, w = x^2 - 2x + 1.$$

$$13. f[f(4)] = 1.$$

$$14. f[g(x)] = \begin{cases} e^{2x} + 1, & -\infty < x \leq 0, \\ 3e^x - 2, & 0 < x \leq \ln 2. \end{cases}$$