

01集合的概念与运算 (练习题)

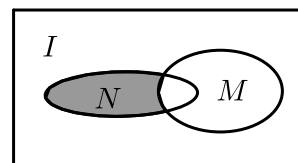
1. 元素的互异性

1. 已知集合 $B = \{a, a^2, 2\}$, $1 \in B$, 则实数 a 的值为 () .
A. 1 B. -1 C. ± 1 D. $-\sqrt{2}$
2. 设集合 $\left\{a, \frac{b}{a}, 1\right\} = \{a^2, a+b, 0\}$, 则 $a^{2014} + b^{2015} = \underline{\hspace{2cm}}$.

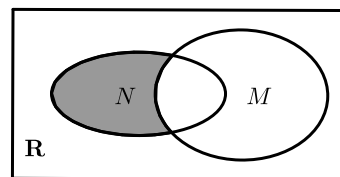
2. 交并补的不含参运算

3. 设集合 $A = \{x | -1 < x < 2\}$, $B = \{x | 1 \leq x \leq 3\}$.
(1) 求 $A \cap B$.
(2) 求 $A \cup (\complement_{\mathbf{R}} B)$.
4. 已知集合 $A = \{x | |x| > 1\}$, $B = \left\{x \left| x > -\frac{1}{2} \right.\right\}$, 且 $(\complement_{\mathbf{R}} B) \cap A = ()$.
A. $\left(-\infty, -\frac{1}{2}\right]$ B. $(-\infty, -1)$ C. $\left(-\frac{1}{2}, 1\right)$ D. $(1, +\infty)$
5. 已知集合 $A = \{x | x^2 - x - 2 > 0\}$, 则 $\complement_{\mathbf{R}} A = ()$.
A. $\{x | -1 < x < 2\}$ B. $\{x | -1 \leq x \leq 2\}$
C. $\{x | x < -1 \text{ 或 } x > 2\}$ D. $\{x | x \leq -1 \text{ 或 } x \geq 2\}$
6. 集合 $M = \{(x, y) | x + y = 2\}$, $N = \{(x, y) | x - y = 4\}$, 则集合 $M \cap N$ 为 () .
A. $\{3, -1\}$ B. $(3, -1)$ C. $\{(3, -1)\}$ D. $\{x = 3, y = -1\}$
7. 设集合 $A = \{x | x^2 = 1\}$, $B = \{x | x^2 - 2x - 3 = 0\}$, 则 $A \cap B$ 等于 () .
A. $\{3\}$ B. $\{1\}$ C. $\{-1\}$ D. $\emptyset$
8. 设集合 $A = \{x | x^2 - 4x + 3 < 0\}$, $B = \{x | 2x - 3 > 0\}$, 则 $A \cap B = ()$.
A. $\left(-3, -\frac{3}{2}\right)$ B. $\left(-3, \frac{3}{2}\right)$ C. $\left(1, \frac{3}{2}\right)$ D. $\left(\frac{3}{2}, 3\right)$
9. 已知集合 $M = \{y | y = x^2 - 1, x \in \mathbf{R}\}$, 集合 $N = \left\{x \left| y = \sqrt{3 - x^2} \right.\right\}$, $M \cap N = ()$.
A. $\{(-\sqrt{2}, 1), (\sqrt{2}, 1)\}$ B. $[-1, \sqrt{3}]$
C. $[0, \sqrt{3}]$ D. $\emptyset$
10. 设全集 $U = \{x | 0 < x < 10, x \in \mathbf{N}^*\}$, 若 $A \cap B = \{3\}$, $A \cap \complement_U B = \{1, 5, 7\}$, $\complement_U A \cap \complement_U B = \{9\}$, 则
 $A = \underline{\hspace{2cm}}$, $B = \underline{\hspace{2cm}}$.

11. 设全集 $I = \mathbf{R}$, $M = \{x | x^2 > 4\}$, $N = \left\{x \mid \frac{2}{x-1} \geq 1\right\}$, 如图所示, 则图中阴影部分所表示的集合为 ().



- A. $\{x | x < 2\}$ B. $\{x | -2 < x < 1\}$ C. $\{x | -2 \leq x \leq 2\}$ D. $\{x | 1 < x \leq 2\}$
12. 已知集合 $M = \{x | x^2 - 3x - 10 < 0\}$, $N = \{x | y = \sqrt{9 - x^2}\}$, 且 M 、 N 都是全集 $\mathbf{R}$ ($\mathbf{R}$ 为实数集) 的子集, 则如图所示韦恩图中阴影部分所表示的集合为 ().



- A. $\{x | 3 < x \leq 5\}$ B. $\{x | x < -3 \text{ 或 } x > 5\}$
 C. $\{x | -3 \leq x \leq -2\}$ D. $\{x | -3 \leq x \leq 5\}$