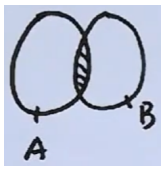
集合 运算 关系

运算

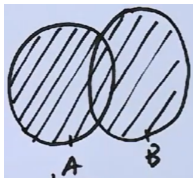
交



$A \cap B$

AB

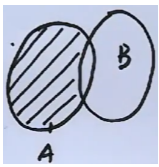
并



$A \cup B$

$A + B$

差



$A - B$

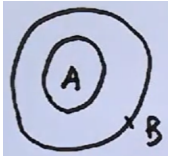
$A \backslash B$

补

$\overline{A}$

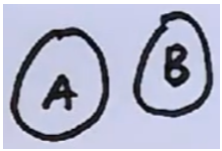
关系

包含



$A \subset B$

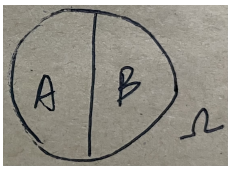
互斥（不相容）



$$\forall x \in A \Rightarrow x \notin B, \forall x \in B \Rightarrow x \notin A$$

即$AB = \emptyset$

对立

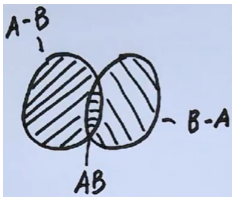


$$\forall x \in A \Rightarrow x \notin B, \forall x \in B \Rightarrow x \notin A$$

且$x \in \Omega \Rightarrow x \in A$或$x \in B$

即$AB = \emptyset$且$A + B = \Omega$

或$\overline{A} = B$



$$A = (A - B) + AB$$

且$A - B$与AB互斥

$$A + B = (A - B) + AB + (B - A)$$

且$A - B, AB, B - A$两两互斥

三角 反三角

三角

$$\sec x = \frac{1}{\cos x}$$

$$\csc x = \frac{1}{\sin x}$$

$$\sec^2 x = 1 + \tan^2 x$$

$$\csc^2 x = 1 + \cot^2 x$$

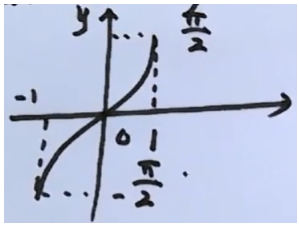
$$\sin \frac{x}{2} = \pm \sqrt{\frac{1 - \cos x}{2}}$$

$$\csc \frac{x}{2} = \pm \sqrt{\frac{1 + \cos x}{2}}$$

反三角

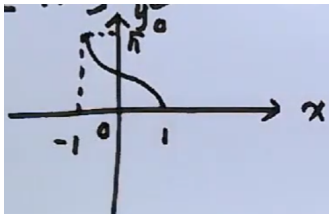
$y = f(x)$单调 $\Rightarrow$ $\exists$反函数

$$y=\sin x, x\in[-\frac{\pi}{2},\frac{\pi}{2}]$$
$$y=\cos x, x\in[0,\pi]$$



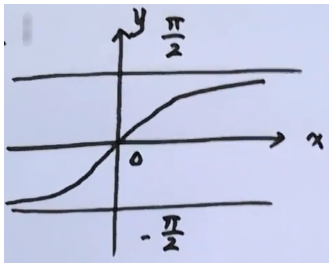
$$y=\arcsin x$$

1. $x\in[-1,1], y\in[-\frac{\pi}{2},\frac{\pi}{2}]$
2. $y=\arcsin x$为奇函数



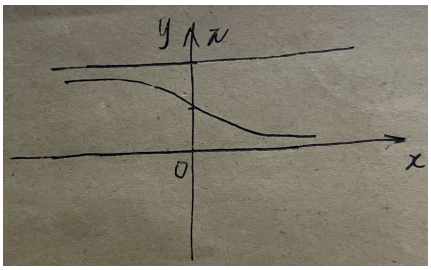
$$y=\arccos x$$

$$x\in[-1,1], y\in[0,\pi]$$



$$y=\arctan x$$

1. $x\in(-\infty,+\infty), y\in(-\frac{\pi}{2},\frac{\pi}{2})$
2. $y=\arctan x$为奇函数



$$y=arccot\ x$$

$$x\in(-\infty,+\infty), y\in(0,\pi)$$

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1. $\arcsin x + \arccos x = \dfrac{\pi}{2}, (-1 \leq x \leq 1)$
2. $\arctan x + arccot\ x = \dfrac{\pi}{2}, (-\infty \leq x \leq +\infty)$

常见不等式与数列

1. $0 \leq ||a| - |b|| \leq |a \pm b| \leq |a| + |b|$
2. $a_i \geq 0 (1 \leq i \leq n)$

   $\sqrt[n]{a_1 \dots a_n} \leq \dfrac{a_1 + \dots + a_n}{n}$

   几何平均数 $\leq$ 代数平均数