

مثالها

مثال) مشتق توابع معکوس مثلثاتی زیر را محاسبه کنید.

$$1) \begin{cases} f : [-1,1] \rightarrow \left[-\frac{\pi}{2}, \frac{\pi}{2}\right] \\ \text{if } y = \sin^{-1} x = \text{Arc sin } x \Rightarrow y' = \frac{1}{\sqrt{1-x^2}} \end{cases}$$

$$2) \begin{cases} f : [-1,1] \rightarrow [0,\pi] \\ \text{if } y = \cos^{-1} x = \text{Arc cos } x \Rightarrow y' = \frac{-1}{\sqrt{1-x^2}} \end{cases}$$

$$3) \begin{cases} f : \mathbb{R} \rightarrow \left(-\frac{\pi}{2}, \frac{\pi}{2}\right) \\ \text{if } y = \tan^{-1} x = \text{Arc tan } x \Rightarrow y' = \frac{1}{1+x^2} \end{cases}$$

$$4) \begin{cases} f : \mathbb{R} \rightarrow (0,\pi) \\ \text{if } y = \cot g^{-1} x = \text{Arc cot } gx \Rightarrow y' = \frac{-1}{1+x^2} \end{cases}$$

$$5) \begin{cases} f : (-\infty,-1] \cup [1,+\infty) \rightarrow \left[-\frac{\pi}{2}, 0\right) \cup \left(0, \frac{\pi}{2}\right] \\ y = \text{Arc csc } x = \text{Arc sin } \frac{1}{x} \Rightarrow y' = \frac{-1}{|x|\sqrt{x^2-1}} \quad ; \quad |x| > 1 \end{cases}$$

$$6) \begin{cases} f : (-\infty,-1] \cup [1,+\infty) \rightarrow \left[0, \frac{\pi}{2}\right) \cup \left(\frac{\pi}{2}, \pi\right] \\ \text{if } y = \text{Arc sec } x = \text{Arc cos } \frac{1}{x} \Rightarrow y' = \frac{1}{|x|\sqrt{x^2-1}} \quad ; \quad |x| > 1 \end{cases}$$