

Inverse Trig Functions

$$\text{If } \sin x = \frac{1}{2} \text{ then } x = \sin^{-1}\left(\frac{1}{2}\right) \square$$

We also call this $\arcsin\left(\frac{1}{2}\right)$ so we say $x = \arcsin\left(\frac{1}{2}\right)$

The inverse trig functions are known as

$$y = \arcsin x, y = \arccos x, y = \arctan x$$

They are inverse functions, hence

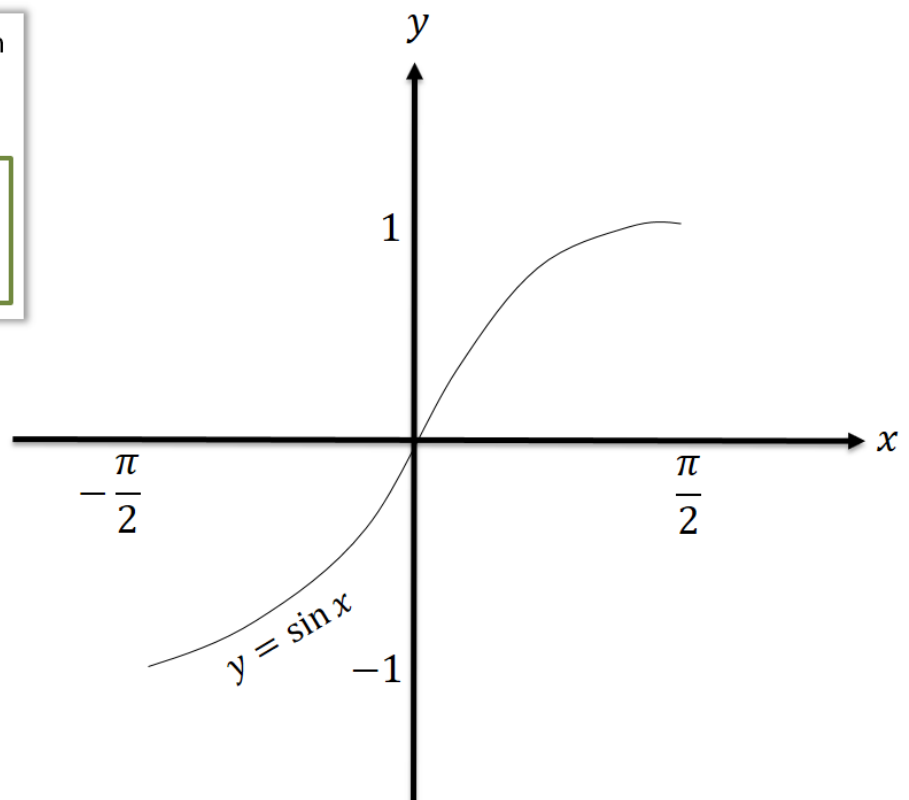
- They only exist for a one to one function
- They map from the range of the original function back to its original domain
- The graphs are reflections of the original in the line $y = x$.

Inverse Trig Functions

You need to know how to sketch $y = \arcsin x$, $y = \arccos x$, $y = \arctan x$.

(Yes, you could be asked in an exam!)

We have to restrict the domain of $\sin x$ to $-\frac{\pi}{2} \leq x < \frac{\pi}{2}$ before we can find the inverse. Why?



Inverse Trig Functions

$$y = \arccos x$$

$$y = \arctan x$$

Evaluating inverse trig functions

[Textbook] Work out, in radians, the values of:

- a) $\arcsin\left(-\frac{\sqrt{2}}{2}\right)$
- b) $\arccos(-1)$
- c) $\arctan(\sqrt{3})$

You can simply use the $\sin^{-1} x$, $\cos^{-1} x$ and $\tan^{-1} x$ buttons on your calculator.

If you don't have a calculator, just use the *sin*, *cos*, *tan* graphs backwards.

One Final Problem...

Edexcel C3 Jan 2007

8. (ii) Given that

$$y = \arccos x, \quad -1 \leq x \leq 1 \quad \text{and} \quad 0 \leq y \leq \pi,$$

(a) express $\arcsin x$ in terms of y .

(2)

(b) Hence evaluate $\arccos x + \arcsin x$. Give your answer in terms of π .

(1)