6.5) Inverse trigonometric functions

Worked example

Sketch the graph of:

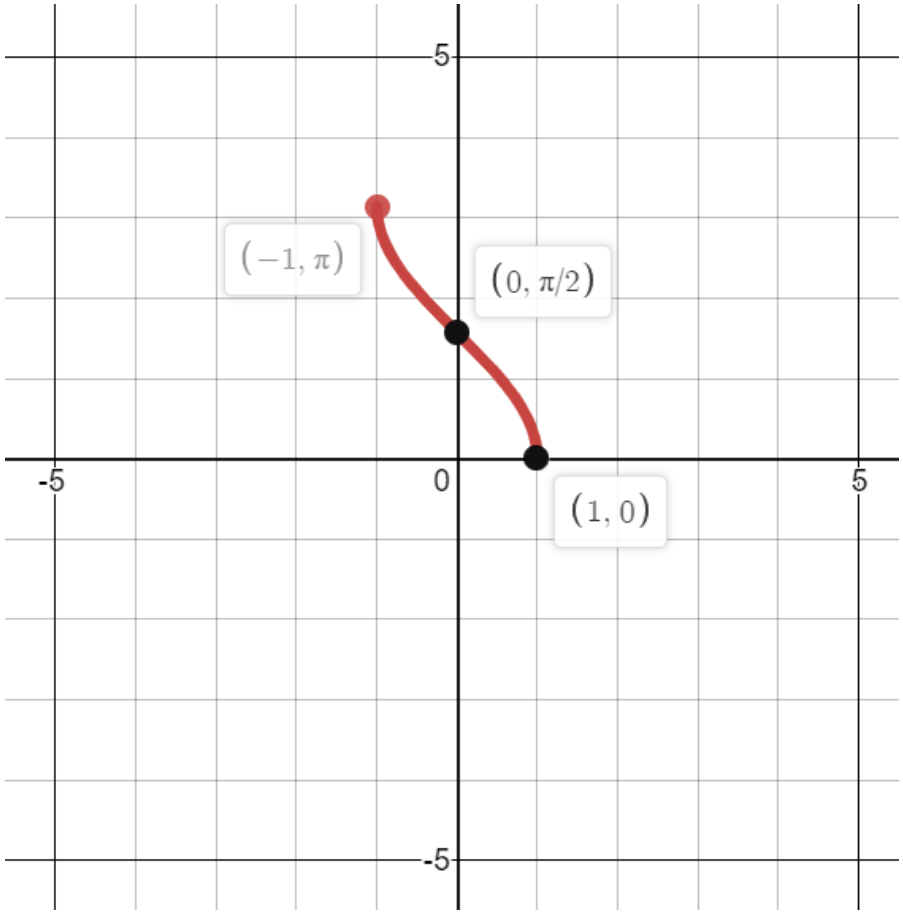
$$y = \arcsin x$$

$$y = \arctan x$$

Your turn

Sketch the graph of:

$$y = \arccos x$$



Graphs used with permission from DESMOS: https://www.desmos.com/

Worked example

Work out, in radians, the values of:

a) $\arcsin\left(\frac{\sqrt{2}}{2}\right)$

b) $\arccos(1)$

c) $\arctan\left(-\sqrt{3}\right)$

Your turn

Work out, in radians, the values of:

a) $\arcsin\left(-\frac{\sqrt{2}}{2}\right)$

b) $\arccos(-1)$

c) $\arctan\left(\sqrt{3}\right)$

a) $-\frac{\pi}{4}$

b) π

c) $\frac{\pi}{3}$

Worked example	Your turn
Given that $y = \arcsin x$, $-1 \leq x \leq 1$ and $0 \leq y \leq \pi$, a) Express $\arccos x$ in terms of y b) Hence evaluate $\arcsin x - \arccos x$	Given that $y = \arccos x$, $-1 \leq x \leq 1$ and $0 \leq y \leq \pi$, a) Express $\arcsin x$ in terms of y b) Hence evaluate $\arccos x + \arcsin x$ a) $\arcsin x = \frac{\pi}{2} - y$ b) $\frac{\pi}{2}$

Worked example

Prove that for $0 \leq x \leq 1$, $\arcsin x = \arccos\sqrt{1-x^2}$ and give a reason why this result is not true for $-1 \leq x \leq 0$

Your turn

Prove that for $0 \leq x \leq 1$, $\arccos x = \arcsin\sqrt{1-x^2}$ and give a reason why this result is not true for $-1 \leq x \leq 0$

Proof

Then reason e.g. counter example $x = -\frac{1}{\sqrt{2}}$