

## Inverse trig. practice

math121

① Define  $\arccos(x)$  to be the angle  $\vartheta$  in  $[0, \pi]$  st.  $\cos\vartheta = x$ .

The following exercises are meant to allow you to apply the same sort of reasoning as we used to study  $\arctan(x)$  &  $\arcsin(x)$ .

a) Why do we use  $[0, \pi]$  instead of  $[-\pi/2, \pi/2]$  (like with  $\arcsin x$ )?

b) Sketch the graph of  $\arccos(x)$ . What is its domain & range?

c) Evaluate  $\sin(\arccos(-1/2))$ .

d) Use implicit differentiation to find  $\frac{d}{dx}(\arccos(x))$ .

//comment:  $\arcsin x$  is used more often in integrals. Try to guess why.

② a) Find  $\frac{d}{dx} \arcsin(\sqrt{x})$ .

b) Find  $\frac{d}{dx} \arctan\left(\frac{x}{z}\right)$ .

③ a) Find  $\int \frac{e^x}{1+e^{2x}} dx$

b) Find  $\int_0^{\pi/2} \frac{\sin x}{1+\cos^2 x} dx$

④ a) Find  $\int \frac{1}{25+x^2} dx$

b) Find  $\int \frac{1}{\sqrt{a-x^2}} dx$

// Hint: try to scale the numerator & denominator to get a more familiar form.