Consider the inverse sine,

$$f(x) = \sin^{-1} x = \arcsin x.$$

if

$$y = \sin^{-1} x,$$

then

$$x = \boxed{}.$$

Assume we would like to find y', then we need to differentiate both sides such that

$$1 = \boxed{},$$

where we have used the chain rule to differentiate the right hand side.

Solving for y' gives,

$$y' = \boxed{},$$

To finish this we need to find $\cos y$ in terms of x:

We know that $\sin y = x$, so that the corresponding right triangle is

From the triangle we find

$$\cos y = \boxed{},$$

so that

$$y' = \boxed{}.$$

Exercise:
Find the derivative of $\tan^{-1} x$