

Exercise 70

Simplify the expression.

$$\tan(\sin^{-1} x)$$

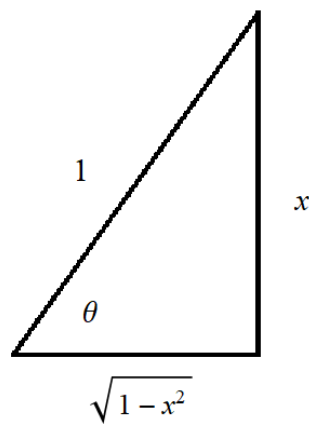
Solution

An inverse trigonometric function gives an angle. Let θ represent it.

$$\theta = \sin^{-1} x$$

$$\sin \theta = x = \frac{x}{1}$$

Draw the implied right triangle, using the Pythagorean theorem to determine the unknown length.



We can see that

$$\tan \theta = \frac{x}{\sqrt{1-x^2}}.$$

Therefore,

$$\tan(\sin^{-1} x) = \frac{x}{\sqrt{1-x^2}}.$$