Exercise 212

For the following exercises, evaluate the functions. Give the exact value.

$$\cos\left(\tan^{-1}\left(\sqrt{3}\right)\right)$$

Solution

The inverse tangent gives an angle between $-\pi/2$ and $\pi/2$.

$$x = \tan^{-1}\left(\sqrt{3}\right)$$

$$\tan x = \sqrt{3}$$

The value of x that satisfies this equation is $\pi/3$. Now take the cosine of $\pi/3$.

$$\cos\frac{\pi}{3} = \frac{1}{2}$$

Therefore,

$$\cos\left(\tan^{-1}\left(\sqrt{3}\right)\right) = \frac{1}{2}.$$