

Precalculus

**Simplify basic trigonometric functions
evaluated on basic inverse trigonometric
functions**

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Example

Find $\tan \left(\arcsin \left(\frac{1}{3} \right) \right)$.

- Let $\theta = \arcsin \left(\frac{1}{3} \right)$, so $\sin \theta = \frac{1}{3}$.
- Draw a right triangle with opposite side 1 and hypotenuse 3.
- Let the angle θ be as labeled. Then $\sin \theta = \frac{1}{3}$ and so $\theta = \arcsin \left(\frac{1}{3} \right)$.
- Length of adjacent side $= \sqrt{3^2 - 1^2} = \sqrt{8} = 2\sqrt{2}$.
- Then $\tan \left(\arcsin \left(\frac{1}{3} \right) \right) = \frac{1}{2\sqrt{2}}$.

