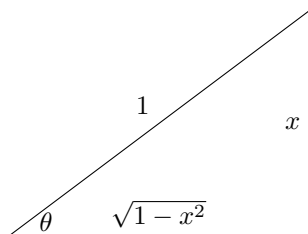
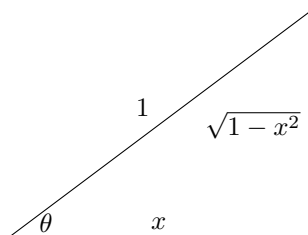


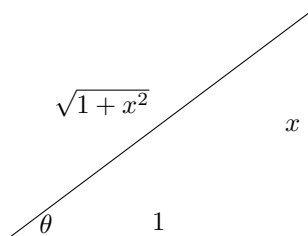
Inverse Trig conversions



$$\theta = \sin^{-1}(x) = \cos^{-1}(\sqrt{1-x^2}) = \tan^{-1}\left(\frac{x}{\sqrt{1-x^2}}\right) = \cot^{-1}\left(\frac{\sqrt{1-x^2}}{x}\right).$$



$$\theta = \cos^{-1}(x) = \sin^{-1}(\sqrt{1-x^2}) = \tan^{-1}\left(\frac{\sqrt{1-x^2}}{x}\right) = \cot^{-1}\left(\frac{x}{\sqrt{1-x^2}}\right).$$



$$\theta = \tan^{-1}(x) = \sin^{-1}\left(\frac{x}{\sqrt{1+x^2}}\right) = \cos^{-1}\left(\frac{1}{\sqrt{1+x^2}}\right) = \cot^{-1}\left(\frac{1}{x}\right).$$

Examples:

- Calculate: $\sin(\tan^{-1}(t))$

Answer:

$$\begin{aligned} \sin(\tan^{-1}(t)) &= \sin\left(\sin^{-1}\left(\frac{t}{\sqrt{1+t^2}}\right)\right) \\ &= \frac{t}{\sqrt{1+t^2}}. \end{aligned}$$

- Calculate: $\tan(\sin^{-1}(y))$

Answer:

$$\begin{aligned}\tan(\sin^{-1}(y)) &= \tan(\tan^{-1}(\frac{y}{\sqrt{1-y^2}})) \\ &= \frac{y}{\sqrt{1-y^2}}.\end{aligned}$$

- Calculate: $\sin(\cos^{-1}(x))$

Answer:

$$\begin{aligned}\sin(\cos^{-1}(x)) &= \sin(\sin^{-1}(\sqrt{1-x^2})) \\ &= \sqrt{1-x^2}.\end{aligned}$$