

$$f(x) = 3 + x^2 + \tan\left(\frac{\pi x}{2}\right) \quad -1 < x < 1$$

$$f^{-1}(3) = b \iff f(b) = 3$$

note  $f(0) = 3$ ,  $f(f^{-1}(5)) = 5$

so  $f^{-1}(3) = 0$ ,

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$$\ln x + \ln(x-1) = 1$$

$$\ln(x(x-1)) = 1$$

$$e^{\ln(x^2-x)} = e^1 \quad \begin{matrix} x^2-x=2 \\ x^2-x-2=0 \end{matrix}$$

$$x^2-x = e$$

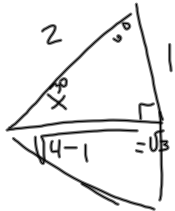
$$x^2-x-e = 0 \quad \text{+ use quad. formula.}$$

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eg

a)  $\arctan(-1) = -\frac{\pi}{4}$ , since  $\tan\left(-\frac{\pi}{4}\right) = -1$

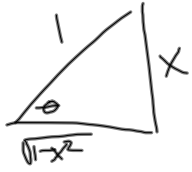
b)  $\csc^{-1}(2) = \arccsc(2)$   
 means  $\csc x = 2$   
 ie  $\frac{1}{\sin x} = 2$   
 $\frac{1}{2} = \sin x$   
 $x = 30^\circ$



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

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



so

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

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

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