Answer on Question #67239 – Math – Trigonometry

Question

if theta=sin^-1(x)+cos^-1(x)-tan^-1(x) and x>0 or x=0 then options

1)45<theta<90

2)0<theta<180

Solution

Using complementary angles rule for $\cos^{-1} x = \frac{\pi}{2} - \sin^{-1} x$ we can obtain

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

Range of $\tan^{-1} x$ is $\left[-\frac{\pi}{2}; \frac{\pi}{2}\right]$

Range of $\theta = \frac{\pi}{2} - \tan^{-1} x$ is $[0; \pi]$

The range for θ will be $0^\circ < \theta < 180^\circ$.

Answer: 2) $0^\circ < \theta < 180^\circ$