

MULTIPLE CORRECT ANSWER

Which of the following quantities is/are positive?

(1) $\cos(\tan^{-1}(\tan 4))$ (2) $\sin(\cot^{-1}(\cot 4))$

(3) $\tan(\cos^{-1}(\cos 5))$ (4) $\cot(\sin^{-1}(\sin 4))$

SOLUTION

(1), (2), (3)

(1) $\cos(\tan^{-1}(\tan(4 - \pi)))$
 $= \cos(4 - \pi) = \cos(\pi - 4) = -\cos 4 > 0$

(2) $\sin(\cot^{-1}(\cot(4 - \pi)))$
 $= \sin(4 - \pi) = -\sin 4 > 0$ (as $\sin 4 < 0$)

(3) $\tan(\cos^{-1}(\cos(2\pi - 5)))$
 $= \tan(2\pi - 5) = -\tan 5 > 0$ (as $\tan 5 < 0$)

(4) $\cot(\sin^{-1}(\sin(\pi - 4))) = \cot(\pi - 4) = -\cot 4 < 0$