Let cos x = .28 and cos y = .74. Which is x – y?

A. cos^(–1).28 + cos^(–1).74
B. –cos^(–1).28 – cos^(–1).74
C. cos^(–1).28 – cos^(–1).74
D. –cos^(–1).28 + cos&(–1).74

Solution:

Let us solve each equation:

$$\cos x = 0.28$$

$$x = \pm \cos^{-1} 0.28 + 2\pi k\,, \qquad k - integer\ constant$$

$$\cos y = 0.74$$

$$y = \pm \cos^{-1} 0.74 + 2\pi n, \qquad n - integer\ constant$$

Now we can simply find the difference between x and y:

1. Angles in the range $0 < x < \pi, 0 < y < \pi$:

$$x - y = \cos^{-1} 0.28 - \cos^{-1} 0.74$$

Correct answer in this case is **C**

2. For all angles:

Since trigonometric equation has not one solution, all responses are correct because of the ambiguity of the angle (it may be x=$\cos^{-1} 0.28\,, -\cos^{-1} 0.28\,, \cos^{-1} 0.28 + 2\pi k$, …,

$y = \cos^{-1} 0.74, -\cos^{-1} 0.74, \cos^{-1} 0.28 + 2\pi k$, …)

$$x - y = \cos^{-1} 0.28 - (-\cos^{-1} 0.74) = \cos^{-1} 0.28 + \cos^{-1} 0.74 \ \ (answer\ \boldsymbol{A})$$

$$x - y = -\cos^{-1} 0.28 - (\cos^{-1} 0.74) = -\cos^{-1} 0.28 - \cos^{-1} 0.74 \ \ (answer\ \boldsymbol{B})$$

$$x - y = \cos^{-1} 0.28 - (\cos^{-1} 0.74) = \cos^{-1} 0.28 - \cos^{-1} 0.74 \ \ (answer\ \boldsymbol{C})$$

$$x - y = -\cos^{-1} 0.28 - (-\cos^{-1} 0.74) = -\cos^{-1} 0.28 + \cos^{-1} 0.74 \ \ (answer\ \boldsymbol{D})$$

Answer: Angles in the range $0 < x < \pi, 0 < y < \pi$: correct answer: **C**

For all angles: all answers are correct: **A, B, C, D,**

For the correct solution of the problem we need to know possible values of the angles x and y.