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Sample Task Questions

# **Questions with Answer Keys** MathonGo The value of x for which $\sin(\cot^{-1}(1+x)) = \cos(\tan^{-1}x)$ is mathongo /// mathongo (1) $\frac{1}{2}$ mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo (3) 0(4) - 1 mathongo /// mathongo /// mathongo /// mathongo /// mathongo Q2mathongo mathongo ma The value of $\cos\left(\frac{1}{2}\cos^{-1}\left(\cos\left(\sin^{-1}\frac{\sqrt{3}}{8}\right)\right)\right)$ is mathongo /// mathongo /// mathongo (1) 16 athongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo mathongo /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo $(3)_{1}$ $\frac{3}{2}$ mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo **O3** The value of $\sin^{-1}\sin 17 + \cos^{-1}\cos 10$ is equal to mathongo mathongo mathongo (1) 27 nathongo /// mathongo /// mathongo /// mathongo /// mathongo (2) - 27mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo $(3) 17 - 5\pi$ (4) $9\pi$ 27 ongo /// mathongo /// mathongo /// mathongo /// mathongo // mathongo /// mathongo /// mathongo /// mathongo /// mathongo

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# **Questions with Answer Keys**

The value of  $\sin \left\{ \cot^{-1} \left[ \cos \left( \cot^{-1} \left( \frac{1}{x} \right) \right) \right] \right\}$  is equal to (x > 0)Mathongo

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(1) 
$$\sqrt{\frac{1+x^2}{2+x^2}}$$
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$$(2)\sqrt{\frac{1-x^2}{2+x^2}}$$
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(4) 
$$\sqrt{\frac{2+x^2}{1+x^2}}$$
 ongo /// mathongo /// mathongo /// mathongo /// mathongo ///

If the value of the expression 
$$\tan\left(\frac{1}{2}\cos^{-1}\frac{2}{\sqrt{5}}\right)$$
 is in the form of  $a+\sqrt{b}$  where  $a,\ b\in Z$ , then the value of  $\frac{a+b}{b}$  is

$$\frac{\sqrt{5}}{\sqrt{5}+4\sqrt{2}} \circ \frac{\sqrt{5}}{\sqrt{2}} \circ \frac{\sqrt{2}}{\sqrt{2}} \circ \frac{\sqrt{2}$$

$$\frac{\pi}{2}$$
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**Questions with Answer Keys** 

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The complete solution set of the inequality  $\cos^{-1}(\cos 4) > 3x^2 - 4x$  is

(2)  $\left(\frac{2-\sqrt{6\pi-8}}{\ln a_3 \ln r}, 0\right)$  /// mathongo /// mathongo /// mathongo /// mathongo

///. mathongo ///. mathongo ///. mathongo

(3) (-2,2) ongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo

(4)  $\left(\frac{2-\sqrt{6\pi-8}}{1-103}, \frac{2+\sqrt{6\pi-8}}{3}\right)$  athongo /// mathongo /// mathongo /// mathongo /// mathongo

Q8

If  $x = \sin\left(2\tan^{-1}3\right)$  and  $y = \sin\left(\frac{1}{2}\tan^{-1}\frac{4}{3}\right)$ , then

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(1) 2x = 1 - y /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo

(3)  $x^2 = 1 + y$  wathong /// mathong /// mathong /// mathong

 $(4) y^2 = 2x - 1$ 

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Q9 mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo

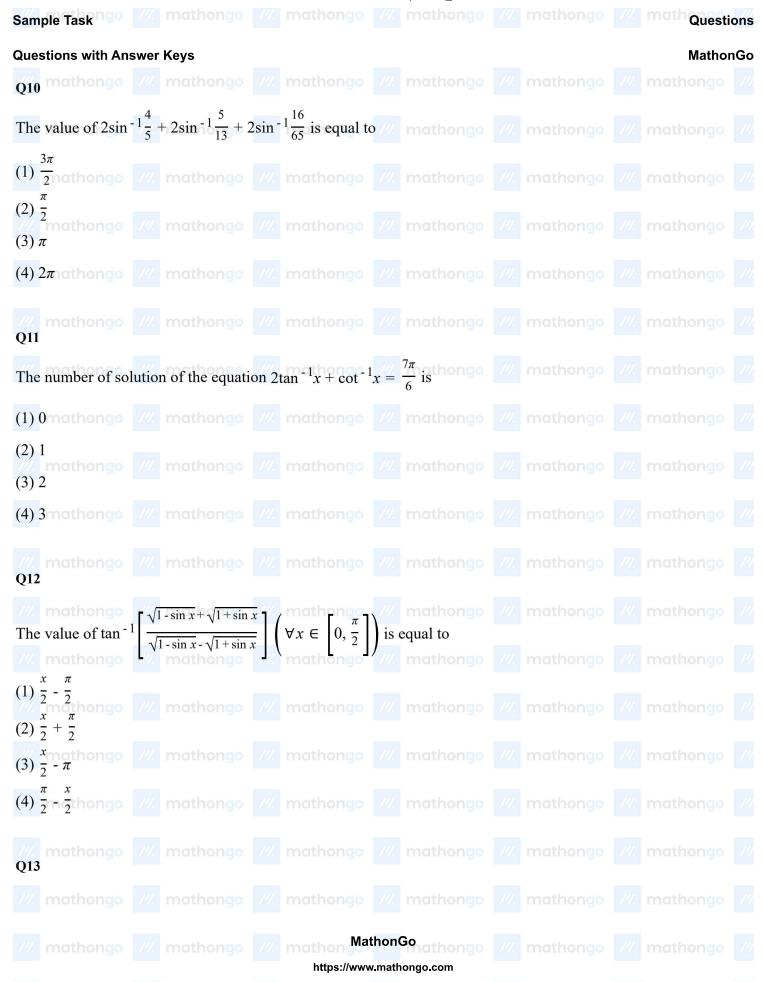
 $\tan\left(2\tan^{-1}\frac{1}{5} + \sec^{-1}\frac{\sqrt{5}}{2} + 2\tan^{-1}\frac{1}{8}\right)$  is equal to:

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#### **Questions with Answer Keys**

#### MathonGo

If the equation  $\sin^{-1}(4x^2 - 12x + 10) + \cos^{-1}(12x - 4x^2 - 10) + \lambda x = 0$  has a real solution, then  $\lambda$  is equal to



If 
$$\cos^{-1}x + \cos^{-1}y + \cos^{-1}z = \pi$$
, then

/// mathongo /// mathongo /// mathongo /// mathongo /// mathongo ///

$$(2) x^2 + y^2 + z^2 + 2xyz = 0 \text{ thongo} \quad \text{mathongo} \quad \text{mathongo}$$

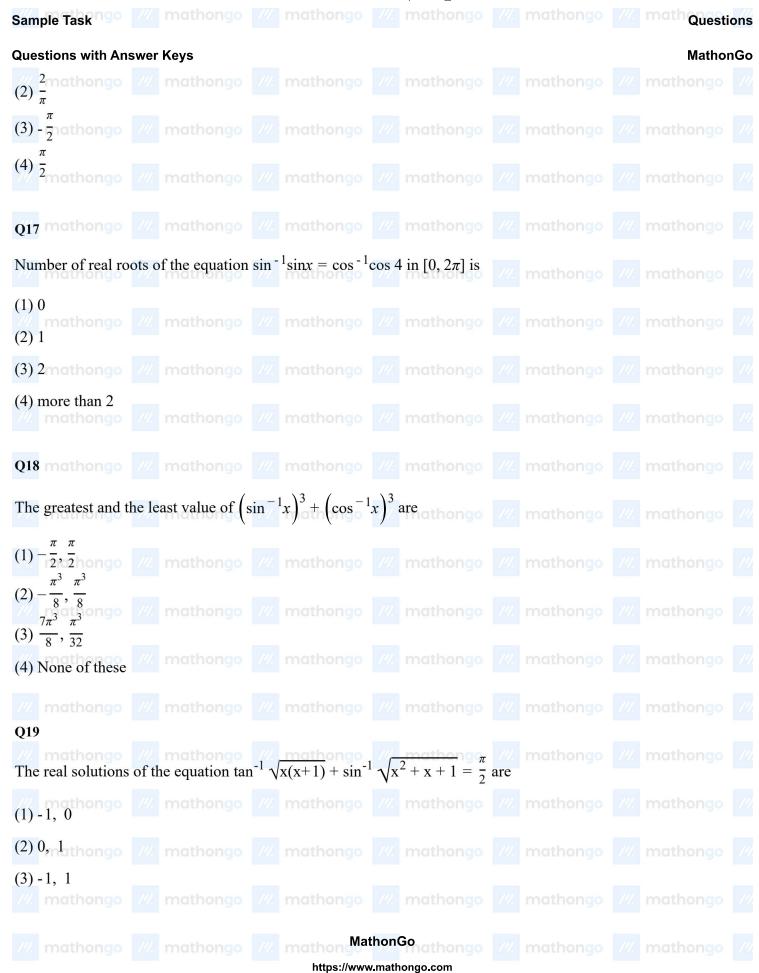
(3) 
$$x^2 + y^2 + z^2 + xyz = 1$$
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If 
$$(\cot^{-1}x)^2 - 7(\cot^{-1}x) + 10 > 0$$
, then the range of x will be mathongo /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo ///

$$(1) (-\infty, \cot 2)$$

The value of a for which 
$$ax^2 + \sin^{-1}(x^2 - 2x + 2) + \cos^{-1}(x^2 - 2x + 2) = 0$$
 has a real solution, is mathongo

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# **Questions with Answer Keys**

# MathonGo

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Q20

The number of integers for which the equation  $\sin^{-1}x + \cos^{-1}x + \tan^{-1}x = n$  has real solution(s) is

(1) 0mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo

mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo

(4) 3mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo

Q21

Let  $a = (\sin^{-1}x)^{\sin^{-1}x}$ ,  $b = (\sin^{-1}x)^{\cos^{-1}x}$ ,  $c = (\cos^{-1}x)^{\sin^{-1}x}$ ,  $d = (\cos^{-1}x)^{\cos^{-1}x}$  and if  $x \in (0, 1)$ , then

(1) a > b > d > c /// mathongo /// mathongo /// mathongo /// mathongo ///

(3) b > a > d > c

(4) a < b < a < c /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo

The value of  $tan^{-1}\left(\frac{9}{19}\right) + tan^{-1}\left(\frac{9}{49}\right) + tan^{-1}\left(\frac{9}{97}\right) + tan^{-1}\left(\frac{9}{163}\right) + \dots \infty$  equals

(2)  $\tan \frac{1}{3} \log \frac{1}{3}$ 

 $(3) \tan^{-1} \left(\frac{2}{3}\right)$  go /// mathongo /// mathongo /// mathongo /// mathongo

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# **Questions with Answer Keys**

# MathonGo

$$(4) \tan^{-1} \left(\frac{3}{2}\right)$$

If 
$$y = \tan^{-1} \frac{1}{1+x+x^2} + \tan^{-1} \frac{1}{x^2+3x+3} + \tan^{-1} \frac{1}{x^2+5x+7} + \dots + \text{ upto } 2n \text{ terms } (\forall x \ge 0), \text{ then } y(0) \text{ is}$$

$$(1) \tan^{-1}(n)$$

(2) 
$$\tan^{-1}(2n)$$

(3) 
$$2\tan^{-1}(n)$$
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The value of the expression 
$$\cot^{-1}\frac{1}{2} + \cot^{-1}\frac{9}{2} + \cot^{-1}\frac{25}{2} + \cot^{-1}\frac{49}{2} + \dots$$
 upto n terms is

(1) 
$$\tan^{-1} 2n$$
  
(2)  $\tan^{-1} (2n - 1)$ 

The value(s) of x satisfying the equation 
$$\sin^{-1}(1-x) - 2\sin^{-1}x = \frac{\pi}{2}$$
 is/are \_\_\_\_\_ mathongo

ion 
$$\sin^{-1}(1-x) - 2\sin^{-1}x = \frac{\pi}{2}$$
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**Questions with Answer Keys** 

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Solution set of  $\left|\sin^{-1}x\right| > \left[\cos^{-1}x\right]$ , where [.] denotes the greatest integer function, is now mathongo

(2) (cos1, sin1)

(3) [sind, 1] ngo /// mathongo /// mathongo /// mathongo /// mathongo

(4) None of these

Q27 mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo

If  $\cot^{-1}(\alpha) = \cot^{-1}2 + \cot^{-1}8 + \cot^{-1}18 + \cot^{-1}32 + \dots$  upto 100 terms, then  $\alpha$  is:

(1) 1.01

(2) 1.00

(3) 1:02thongo /// mathongo /// mathongo /// mathongo /// mathongo

(4) 1.03

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Q28 mathongo /// mathongo /// mathongo /// mathongo /// mathongo

For  $k \in \mathbb{R}$ , let the solutions of the equation  $\cos\left(\sin^{-1}\left(\cot\left(\tan^{-1}\left(\cos\left(\sin^{-1}x\right)\right)\right)\right)\right) = k$ ,  $0 < |x| < \frac{1}{\sqrt{2}}$  be  $\alpha$  and  $\beta$ ,

where the inverse trigonometric functions take only principal values. If the solutions of the equation

 $x^2$  - bx - 5 = 0 are  $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$  and  $\frac{\alpha}{\beta}$ , then  $\frac{b}{k^2}$  is equal to \_ ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo

Q29 mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo

The number of solutions of the equation  $\sin^{-1}x = (\sin x)^{-1}$  is/are

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(1) one

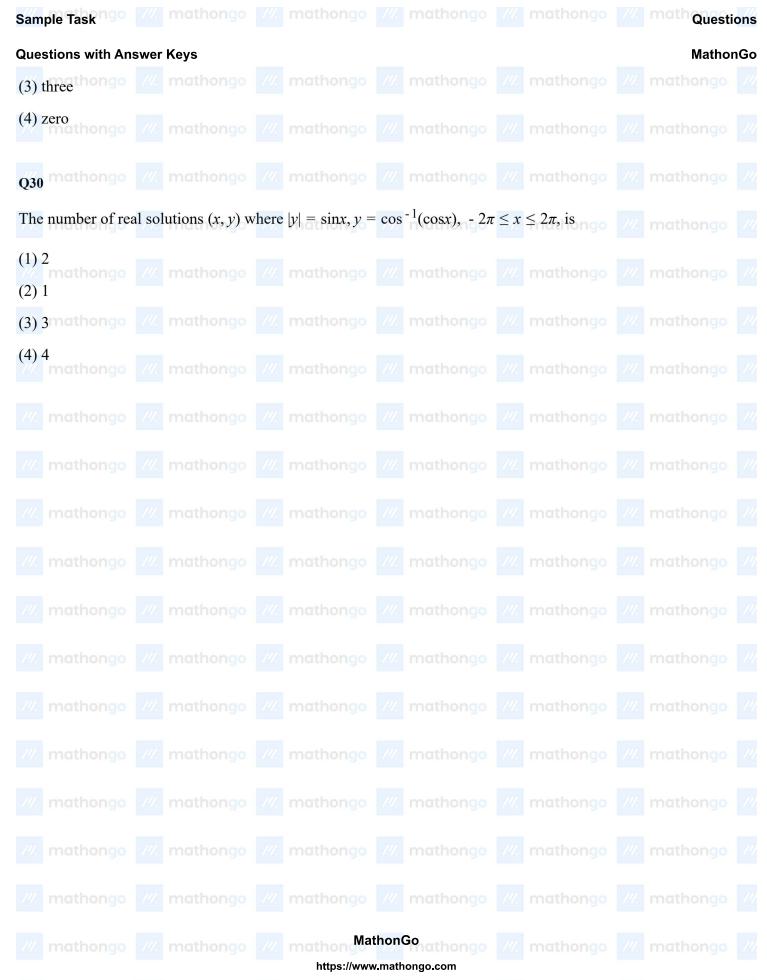
(2) two athongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo



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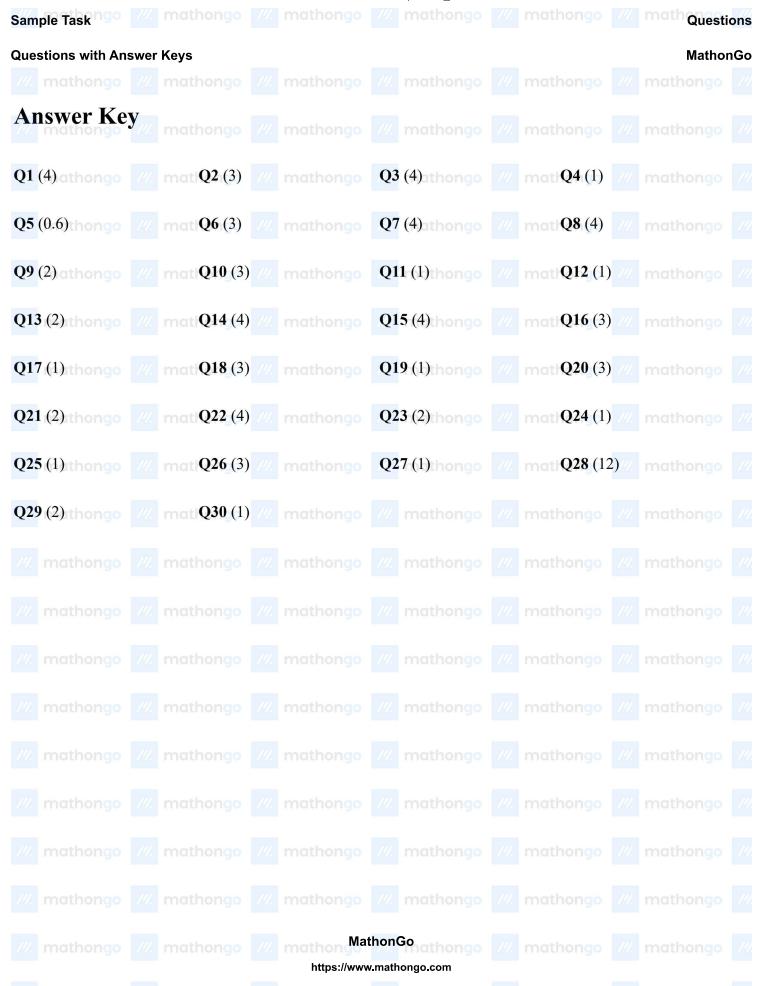
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