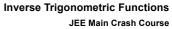


| 1. (2 | 2) | 2. (4) | 3. (2) | 4. (2) | 5. (2) | 6. (2) | 7. (3) | 8. (0.00) |
|-------|--|---|--|-----------------|---------------|---------------|--------|------------------|
| | mathongo | | ` ´ | ` ′ | ` ′ | /// mathongo | ` ′ | ` ' |
| | Hence, $x \in$ | \in $[-1,1]$ and $\sin^{-1}(2$ $-rac{1}{2},rac{1}{2}]$ and $x\geq -rac{\sqrt{3}}{2}$ | /// | | | | | |
| | So the domain (4) $\sin^{-1} \sin^{-1} \sin^{$ | n is $\left[-\frac{\sqrt{3}}{4}, \frac{1}{2} \right]$ $17 = \sin^{-1} \sin(17 - \frac{1}{2})$ | $5\pi + 5\pi$) | | | | | |
| | $\cos^{-1}(\cos 10$ $=\cos^{-1}\cos\{$ | $) = \cos^{-1}\cos(10 - 3)$ $3\pi + (10 - 3\pi)$ $\cos(10 - 3\pi)$ | $3\pi + 3\pi$) mathongo | | | | | |
| | $= \pi - \cos^{-1}$ = $\pi - (10 - $ | (10 0) | | | | | | |
| | (2) athongo Given, | /// mathongo | | | | | | |
| | and $\cos^{-1}x$ - | $-1 y = \frac{2\pi}{3} \dots (i)$ $-\cos^{-1} y = \frac{\pi}{3} \dots (i)$ $t \sin^{-1} x + \cos^{-1} x = 0$ | ·· <i>)</i> | | | | | |
| | Using the above $\Rightarrow \left(\frac{\pi}{2} - \sin^{-1} \frac{1}{2}\right)$ | ove concept, we can $-1x$ $-\left(\frac{\pi}{2} - \sin^{-1}y\right)$ | write mathongo $=\frac{\pi}{3}$ | | | | | |
| | | $x + \sin^{-1}y = \frac{\pi}{3}$ quation (i) and (iii), $\Rightarrow y = 1$ | //// magthongo | | | | | |
| | | ag equation (i) from $\Rightarrow \mathbf{x} = \frac{1}{2}$ | equation (iii), we ge | t ///. mathongo | | | | |
| | (2) As we know | mathongo that $\sin^{-1} x + \cos^{-1}$ | $x=rac{\pi}{2},\ -1\leq x\leq$ | 1. | | | | |
| | (=) 01.01., 1 | $\sin^{-1} \frac{1}{2} + \cos^{-1} \frac{1}{2}$ $\sin^{-1} x + \cos^{-1} x = 1$ $+ \frac{\pi}{2} - \sin^{-1} x = \pi$ | $\frac{1}{2}\int_{-\infty}^{\infty}\sin\left(\frac{\pi}{2}\right)=1$ | | | | | |
| | ⇒athongo ⇒ ⇒ | $3\sin^{-1}x = \frac{\pi}{6}$ $\sin^{-1}x = \frac{\pi}{6}$ $x = \frac{1}{2}$ | $\frac{\pi}{2}$ ///. mathongo | | | | | |
| | $\cot \Big(\cos\!ec^{-1} \Big)$ | $\frac{5}{3} + \tan^{-1}\frac{2}{3}$ | | | | | | |
| | | | | | | | | |
| | $= \cot \left(\tan^{-1} \right)$ $= \cot \left(\tan^{-1} \right)$ | $-\frac{1}{1-\frac{3}{4}\frac{2}{3}}$ dathongo $\frac{17}{12}$ $\frac{1}{2}$ | | | | | | |
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Answer Keys and Solutions

| Answer Keys and Solutions | | JEE Main Crash Course |
|--|--|-----------------------|
| 7. (3) thongo we mathongo we mathongo Let $x = \tan \theta \Rightarrow \theta = \tan^{-1} x$ | | |
| $= 3 \tan^{-1} x - 2 \tan^{-1} x, x < \frac{1}{\sqrt{3}}$ | | |
| $= \tan^{-1} x$ 8. (0.00) $\sin^{-1} x + \sin^{-1} y + \sin^{-1} z = \frac{3\pi}{2}$ mathongo $\Rightarrow \sin^{-1} x = \sin^{-1} y = \sin^{-1} z = \frac{\pi}{2}$ $\Rightarrow \cos^{-1} x = \cos^{-1} y = \cos^{-1} z = 0$ | | |
| $\Rightarrow \cos^{-1} x = \cos^{-1} y = \cos^{-1} z = 0$ 9. (1) : $\tan^{-1} \left(\frac{1}{1 + r + r^2} \right) = \tan^{-1} \left(\frac{r + 1 - r}{1 + r(r + 1)} \right)$ | | |
| $= 	an^{-1}(r+1) - 	an^{-1}(r)$ muthongo | | |
| $\therefore \sum_{r=0}^{n} \left[\tan^{-1}(r+1) - \tan^{-1}(r) \right]$ mathongo mathongo mathongo mathongo = $\tan^{-1}(n+1) - \tan^{-1}(0)$ | | |
| $= \tan^{-1}(n+1)$ mathongo /// mathongo | | |
| $\Rightarrow \sum_{r=0}^{\infty} \tan^{-1} \left(\frac{1}{1+r+r^2} \right) = \tan^{-1} (\infty) = \frac{\pi}{2}$ 10. (1) $\text{Let } T_r = \sum_{r=1}^{\infty} \cot^{-1} \left(3r^2 - r - \frac{1}{3} \right) = \tan^{-1} \left(\frac{3}{9r^2 - 3r} \right)$ | | |
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