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Kelas = XI MIPA 6
No = 18

Tugas MTK Minat

1. Nilai dari $12 \sin 22\frac{1}{2}^\circ \cos 22\frac{1}{2}^\circ = ?$

$12 \sin 22{,}5^\circ \cos 22{,}5^\circ$

$\Rightarrow 6\,(2 \sin 22\frac{1}{2}^\circ \cos \frac{1}{2}^\circ)$

$6 \sin 2(22\frac{1}{2}^\circ)$

$6 \sin 45^\circ$

$6 \cdot \frac{1}{2}\sqrt{2} = 3\sqrt{2}$ (A)

2. Nilai dari $6 - 12 \sin^2 \pi/12 = ?$

$6 - 12 \sin^2 180/12$

$\Rightarrow 6 - 12 \sin^2 15$

$6(1 - 2 \sin^2 15)$

$6 \cos 2.15$

$6 \cos 30$

$6 \cdot \frac{1}{2}\sqrt{3}$

$3\sqrt{2}$ (C)

3. Nilai dari $4 - 8 \cos^2 \frac{3\pi}{8} = ?$

$4 - 8 \cos^2 \frac{3\pi}{8}$

$\Rightarrow 4 - 8 \cos^2 \left(\frac{3\pi}{8}\right)$

$4 - 8\left(\frac{1 + \cos\left(\frac{3\pi}{4}\right)}{2}\right)$

$4 - 4\left(1 - \frac{\sqrt{2}}{2}\right)$

$4 - 4 + \left(4 \cdot \frac{\sqrt{2}}{2}\right)$

$4 - 4 + 2\sqrt{2}$

$2\sqrt{2}$ (E)

4. $\frac{2 \tan 112{,}5}{1 - \tan^2 112{,}5}$ (misal $112{,}5 = x$)

$\Rightarrow \frac{2 \tan x}{1 - \tan^2 x} = \tan 2x$

$\tan 2.112{,}5 = \tan 2x$

$\tan 225^\circ = \tan 2x$

$\tan 45 = \tan 2x$

1 (A) $= \tan 2x$

5. Jika $\sin A = 1/3$ dan A sudut lancip maka $\cos 2A = ?$

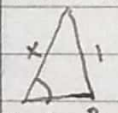
$\cos 2A = 1 - 2 \sin^2 A$

$= 1 - 2\left(\frac{1}{3}\right)^2 A$

$= 1 - 2\,\frac{1}{9}\,A$

$\cos 2A = \frac{7}{9}\,A$ (C)

6. Jika $\tan \alpha = \frac{1}{2}$ dan α sudut lancip maka nilai $\sin 2\alpha =$



$x^2 = 1^2 + 2^2$

$x^2 = 1 + 4$

$x = \sqrt{5}$

$\sin \alpha = \frac{1}{\sqrt{5}}$, $\cos \alpha = \frac{2}{\sqrt{5}}$

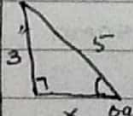
$\sin 2A = 2 \sin A \cdot \cos A$

$= 2\left(\frac{1}{\sqrt{5}}\right) A \cdot \left(\frac{2}{\sqrt{5}}\right) A$

$= 2 \cdot \frac{2}{5}$

$= 4/5$ (C)

7. Jika $\sin A = \frac{3}{5}$ dan A sudut tumpul maka nilai $\tan 2\alpha$ adalah ?



$x^2 = 5^2 - 3^2$

$x = \sqrt{16}$

$x = 4$

$\tan = \frac{3}{4}$

$\tan 2A = \frac{2 \tan}{1 - \tan^2 A}$

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$= \frac{2(3/4)}{1-(3/4)^2 A}$

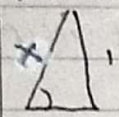
$= \frac{3/2}{1-9/16}$

$= \frac{3/2}{7/16}$

$= 3/2 \times 16/7$

$= 24/7$ (D)

8. Jika Tan B = $\frac{1}{2}$ dan B sudut pada kuadran III maka nilai cos 2B ?



$x = \sqrt{2^2+1^2}$

$x = \sqrt{5}$

$\sin B = \frac{1}{\sqrt{5}}$, $\cos B = \frac{2}{\sqrt{5}}$

kuadran III = Sin, Cos = (-)

$\cos 2B = 1 - 2\sin^2 A$

$= 1 - 2\left(-\frac{1}{\sqrt{5}}\right)^2$

$= 1 - 2 \cdot \frac{1}{5}$

$\cos 2B = 3/5$ (A)

9. Nilai dari $\cos 72^\circ + \sin 72^\circ \cdot \tan 36^\circ$

$\cos 72 + \sin 72 \cdot \tan 36$

$= \cos 72 + \left(\sin 72 \cdot \frac{\sin 36}{\cos 36}\right)$

$= \left(\frac{\cos 72 \cdot \cos 36}{\cos 36}\right) + \left(\frac{\sin 72 \cdot \sin 36}{\cos 36}\right)$

$= \frac{\cos(72^\circ - 36^\circ)}{\cos 36}$

$= \frac{\cos 36}{\cos 36} = 1$ (E)

10. Bentuk $\frac{\sin 2A}{\sin A} - \frac{\cos 2A}{\cos A}$ sama dengan

$\frac{\sin 2A}{\sin A} - \frac{\cos 2A}{\cos A}$

$\frac{(\sin 2A \cos A - \cos 2A \sin A)}{\sin A \cos A}$

$= \frac{\sin A (2A - A)}{\sin A \cos A}$

$= \frac{\sin A}{\sin A \cos A}$

$= \frac{1}{\cos A} / \sec A$ (A)

11. Bentuk $\frac{\sin^3 x + \cos^3 x}{\sin x + \cos x}$ sama dengan

$\frac{\sin^3 x + \cos^3 x}{\sin x + \cos x} =$

$= \frac{(\sin x - \cos x)(\sin^2 x + \sin x \cos x + \cos^2 x)}{(\sin x - \cos x)}$

$= \sin^2 x + \cos^2 x + \sin x \cos x$

$= 1 + \sin x \cos x$

$= 1 - \frac{1}{2} \sin 2x$ (D)

12. Nilai $\cos 22\frac{1}{2}^\circ$ adalah

$\cos 2x = 2\cos^2 x - 1$

$2\cos^2 x = \cos 2x + 1$

$2\cos^2 22{,}5 = \cos 2 \cdot (22{,}5) + 1$

$\cos^2 22{,}5 = \frac{1}{2}(\cos 45 + 1)$

$\cos^2 22{,}5 = \frac{1}{2}(\frac{1}{2}\sqrt{2} + 1)$

$\cos^2 22{,}5 = \frac{1}{4}\sqrt{2} + \frac{1}{2}$

$\cos^2 22{,}5 = \sqrt{\frac{1}{4}(\sqrt{2}+2)}$

$\cos 22{,}5 = \frac{1}{2}\sqrt{(\sqrt{2}+2)}$ (C)

13. Nilai dari $\sin 112{,}5^\circ$ adalah

$\cos 2A = 1 - 2\sin^2 A$

$\cos 2(112{,}5) \rightarrow \cos 225$

$\cos 225^\circ = 1 - 2\sin^2 112{,}5$

$-\frac{1}{2}\sqrt{2} = 1 - 2\sin^2 112{,}5$

$2\sin^2 112{,}5 = 1 + \frac{1}{2}\sqrt{2}$

$\sin^2 112{,}5 = \frac{1}{2} + \frac{1}{4}\sqrt{2}$

$(\sin 112{,}5)^2 = (2+\sqrt{2})/4$

$\sin 112{,}5 = \frac{1}{2}\sqrt{2+\sqrt{2}}$ (C)

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14. Nilai dari $\tan 157,5^\circ$ adalah

$\tan A = 157,5$

$\tan 2A = 315$

$\tan 2A = \frac{2\tan A}{1-\tan^2 A}$

$2\tan A = \tan 2A\,(1-\tan^2 A)$

$2\tan 157,5 = \tan 315\,(1-\tan^2 157,5)$

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

$2x = -1+x^2$

$x^2-2 = 1$

$(x-1)^2 = 1+1$

$(x-1)^2 = 2$

$x = 1+\sqrt{2}$

$x = 1-\sqrt{2}$ (A)

15. Nilai dari $\cos 75^\circ$ adalah

$\cos \frac{1}{2}(150^\circ)$

$= \pm\sqrt{\frac{1+\cos 150^\circ}{2}}$

$= \pm\sqrt{\frac{1+(-\frac{1}{2}\sqrt{3})}{2}}$

$= \pm\sqrt{\frac{1-\frac{1}{2}\sqrt{3}}{2}}$

$= \frac{\sqrt{2-\sqrt{3}}}{4}$

$= \frac{1}{2}\sqrt{2+\sqrt{3}}$ (P)

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