1) (۰,۲۵)

$\cot\alpha = \dfrac{\cos\alpha}{|\sin\alpha|}$ $\dfrac{1}{|\cos|} - \dfrac{\sin}{\cos} = \dfrac{1-\sin}{\cos}$ ✓

$\rightarrow \alpha < \frac{1}{2}$ ~~~~

2) (۲)

$\sin 2\alpha = \dfrac{m-1}{4}$ $-\dfrac{\pi}{12} < \alpha < \dfrac{5\pi}{12}$ $-\dfrac{1}{2} < \sin 2\alpha \leq 1$

$\rightarrow -\dfrac{1}{2} < \dfrac{m-1}{4} \leq 4$

$m-1 \leq 4 \rightarrow m \leq 5$

$4 < 2-2m \rightarrow 2m < -2 \rightarrow m < -1$

$\rightarrow m = (-1, 5]$ ✓

3) (۲)

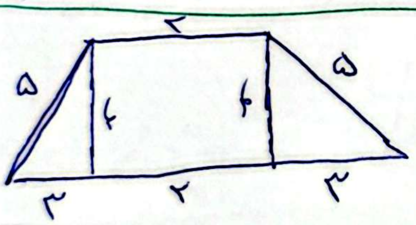
$\tan + \cot = -3$ $\dfrac{3\pi}{4} < \alpha < \pi$ $\dfrac{1}{\sin^3+\cos^3} = \dfrac{1}{(\sin+\cos)(\sin^2+\cos^2-\sin\cos)}$

$\dfrac{1}{\sin\cos} = -3$ $\sin.\cos = -\dfrac{1}{3}$

$(\sin+\cos)^2 = \underbrace{\sin^2+\cos^2}_{1} + \underbrace{2\sin\cos}_{-\frac{2}{3}} \Longrightarrow \sin+\cos = \pm\dfrac{\sqrt{3}}{3}$ (+ غیرقابل قبول)

$\rightarrow \dfrac{1}{\left(-\frac{\sqrt{3}}{3} \times \frac{4}{3}\right)} = -\dfrac{9}{4\sqrt{3}} = \boxed{-\dfrac{3\sqrt{3}}{4}}$ ✓

4) (۲)



$\cos\theta = \dfrac{x}{5} = 0/6 \Rightarrow x = 3$

$9 + h^2 = 25$

$\boxed{h = 4}$

$S = \dfrac{(2+8)\times 4}{2} = \boxed{20}$ ✓

5) (۲)

$\tan(285)\tan(-165) - \sin(1095)\cos(255) = k\cos^2(15)$

$\tan\left(\frac{3\pi}{2}+15\right)\tan(15-\pi) - \sin(15)\cos\left(\frac{3\pi}{2}-15\right)$

$-\cot(15).\tan(15) + \sin(15) * \sin(15)$

$-1 + \sin^2(15) = -\cos^2(15) \longrightarrow k = -1$ ✓

6) (۲)

$\sqrt{3}\cos(210) \times \sin\left(\frac{3\pi}{2}-27\right) - \sqrt{2}\sin(135)\cos(\pi-27)$

$\frac{3}{2} \times \cos(27) + \cos(27) = \frac{5}{2}\cos 27^\circ$

$\dfrac{\frac{5}{2}\cos 27^\circ}{\cos 27^\circ} = \boxed{\dfrac{5}{2}}$ ✓

$f_{(a)} = 16\cos^2(12a)\cos^2(6a)\cos^2(11a)\cos^2(7+a)$. (۲) (7

$8\left(1+\cos(6a)\right).\cos^2(6a).\cos^2(11a).\cos^2(7+a) = 8\left(1+\cos\frac{\pi}{6}\right).\cos^2\left(\frac{\pi}{6}\right)$

$.\cos^2\left(\frac{\pi}{6}\right).\cos^2\left(6\frac{\pi}{2}\right) = 8\times\frac{2+\sqrt{3}}{2}\times\frac{3}{4}\times\frac{1}{4}\times\frac{1}{4} = \boxed{\frac{9+2\sqrt{3}}{16}}$ ✓

(۲) (8

$\frac{1-\sin(a)}{1+\sin(a)} = 4$ $\quad 4+4\sin a = 1-\sin a$ $\quad \sin^2+\cos^2 = 1$

$5\sin a = -3$ $\quad \frac{9}{25}+\frac{16}{25} = 1$

$\sin a = -\frac{3}{5}$ $\quad \cos = -\frac{4}{5}$

$\tan\left(\frac{a}{2}\right) = \frac{\sin(a)}{1+\cos(a)} = \frac{-\frac{3}{5}}{\frac{1}{5}} = \boxed{-3}$ ✓

(۲) (9

$\frac{\sin\theta}{1-\cos\theta}+\frac{1+\cos\theta}{\sin\theta} = \frac{2\sin\left(\frac{\theta}{2}\right)\cos\left(\frac{\theta}{2}\right)}{2\sin\left(\frac{\theta}{2}\right)}+\frac{2\cos\left(\frac{\theta}{2}\right)}{2\sin\left(\frac{\theta}{2}\right)\cos\left(\frac{\theta}{2}\right)}$

$= \frac{4\cos\left(\frac{\theta}{2}\right)}{2\sin\left(\frac{\theta}{2}\right)} = 2\cot\left(\frac{\theta}{2}\right) \Rightarrow \boxed{k=2}$ ✓

(۲) (10

$\sin(\alpha) = \frac{\sqrt{2}}{10} \Rightarrow \cos = \frac{\sqrt{49}}{50}$ $\quad -\frac{7}{5\sqrt{2}} = -\frac{7\sqrt{2}}{10}$

$\cos\left(\frac{11\pi}{4}+\alpha\right) = \cos\left(\frac{3\pi}{4}+\alpha\right) = \cos\frac{2\pi}{4}\times\cos\alpha - \sin\frac{3\pi}{4}\times\sin\alpha$

$\frac{\sqrt{2}}{2}\alpha\frac{7\sqrt{2}}{10}-\frac{\sqrt{2}}{10}\alpha\frac{\sqrt{2}}{2} \Rightarrow \frac{7}{10}-\frac{1}{10} = \boxed{\frac{9}{10}}$ ✓

$\cot\alpha = \frac{\cos\alpha}{\sqrt{1-\cos^2\alpha}} \rightarrow \frac{\cos\alpha}{\sin\alpha} = \frac{\cos\alpha}{|\sin\alpha|} \rightarrow \sin\alpha > 0$ -1

$\frac{1}{\sqrt{\cos^2\alpha}}-\frac{1}{\cot\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|} \rightarrow \frac{1}{|\cos\alpha|}-\frac{\sin\alpha}{\cos\alpha} = \frac{1}{|\cos\alpha|}-\frac{\sin\alpha}{|\cos\alpha|}$

$\rightarrow \cos\alpha > 0 \Longrightarrow$ ناحیه اول