

سوال ۱: $g\left(\frac{x}{r}\right) = \left(f\left(\tan^2 m + \sqrt{r} \cos m\right)\right)' = f'(r) \times \left(r \tan \frac{x}{r} \times \left(1 + \tan^2 \frac{x}{r}\right) + \frac{\sqrt{r} \sin \frac{x}{r}}{-1}\right)$

$\sqrt{r} = f'(r) \times r \rightarrow f'(r) = \frac{\sqrt{r}}{r}$

سوال ۲: $f(m) = \frac{(r + \cos m)(r + \cos^2 m + 2 \cos m)}{(r + \cos m)(r - \cos m)}$

$\left(\frac{r + \cos^2 m + 2 \cos m}{r - \cos m}\right)' = \left(\frac{\cos m (\cos m - r)}{r - \cos m}\right)' = (-\cos m)' + \sin m = -\frac{1}{r}$

$\lim_{m \rightarrow \frac{\pi}{4}} \frac{|f(m) - a|}{m - \frac{\pi}{4}} = 0$

$\frac{\pi}{4}^+ = +\sqrt{a}$
 $\frac{\pi}{4}^- = -\sqrt{a}$

سوال ۳: شیب نیم مسائل ہا در نقطہ $\frac{\pi}{4}$

اختلاف شیب نیم مسائل ہا: $f(a) = f(a) = \sqrt{a}$ $m = \frac{\pi}{4} \rightarrow \sqrt{a} = \sqrt{a} \rightarrow \sqrt{r} = \sqrt{a}$

$\Rightarrow a = \frac{r}{2}$
 $y = -am + r \xrightarrow{\text{عشق در جاتی}} = -a$

$f(r) + f(r) = -1$
 $\downarrow$
 $-fa + r - a$

$\rightarrow -a + r = -1 \rightarrow \boxed{a = \frac{r}{2}}$

سوال ۴

$f'(r) = -\frac{r}{a}$

سوال ۶ ← وقتی تابع بر محور ها مسائل است یعنی هم تابع و هم مشتق آن در آن نقطه = ۰ می باشد

$$n \rightarrow \begin{cases} a + 2a - b = 0 \rightarrow \boxed{b = -14} \\ 3x + a = 0 \rightarrow \boxed{a = -12} \end{cases} \Rightarrow b - a = -14 + 12 = \underline{-2}$$

سوال ۷ ← $f(m) = \sin^n(m^2) \quad \lim_{m \rightarrow 0} \frac{f(m) - f'(m)}{(1 - \cos m)^m} = 22\sqrt{2}$ $\sin(m^2) \sim m^2$

مورد $f(m) \sim 2n m^{2n-1} \rightarrow f(m) \times f'(m) \sim 2n m^{4n-1}$

توان m باید صفر شود $\rightarrow 1 - \cos m \sim \frac{m^2}{2} \rightarrow (1 - \cos m)^m \sim \left(\frac{m^2}{2}\right)^m \rightarrow \frac{m^{2m}}{2^m}$

$\Rightarrow 2^{m+1} n = 22\sqrt{2} \rightarrow 2^{m+1} n = 2^{\frac{11}{2}} \rightarrow n \times 2^{\frac{m+1}{2}} = 2^{\frac{11}{2}} \rightarrow \boxed{n=2}$ $2n-1 = 2m = 0 \rightarrow m = \frac{2n-1}{2} = \frac{3}{2}$ ①

$\boxed{2m+n = 7+2=9}$

سوال ۸ ← نسبت خط مماس بر f' به f''

$$f'(m) = \frac{\frac{1}{\sqrt{m}} (\sqrt{m}-1) - \frac{1}{\sqrt{m}} (\sqrt{m}+1)}{(\sqrt{m}-1)^2} = \frac{-2}{2\sqrt{m} (\sqrt{m}-1)^2}$$

$$f''(m) = \frac{+1 \times \left(\frac{1}{\sqrt{m}} \times (\sqrt{m}-1)^2 - 2\sqrt{m} \times 2(\sqrt{m}-1) \right)}{2 \times 2 \times (\sqrt{m}-1)^2} = \frac{\frac{1}{\sqrt{m}} \times (\sqrt{m}-1)^2 - 4\sqrt{m} \times (\sqrt{m}-1)}{4 \times (\sqrt{m}-1)^2}$$

$$= \frac{\frac{1}{\sqrt{m}} (\sqrt{m}-1) - 4}{4\sqrt{m}-4} = \frac{1 - \frac{1}{\sqrt{m}} - 4}{4\sqrt{m}-4} = \frac{-\frac{1}{\sqrt{m}} - 3}{4\sqrt{m}-4} \times \frac{4\sqrt{m}+4}{4\sqrt{m}+4} = \frac{-4 - 4\sqrt{m} - \frac{4}{\sqrt{m}} - 4}{14 \times 2 - 14}$$

$$= \frac{-8 - 4\sqrt{m}}{14} = \boxed{\frac{-4 - 2\sqrt{m}}{7}}$$

$$\frac{f(0) - f(-1)}{0 + 1} = -11 \rightarrow 1 \times 1 - 1 \times (-a + 1) = -11 \rightarrow +1 \frac{(-a + 1)}{1} = \frac{-11}{1} \leftarrow \text{سوال 9}$$

$$\Rightarrow -a + 1 = -11 \rightarrow -a = -12 \rightarrow a = 12$$

$$m = -\frac{12}{1} \times 1 = -12 \rightarrow f'(m) = 1$$

$$f'(m) = \mu(m^r + 1)^r \times r m \times (a m + 1) + \frac{12}{1} (m^r + 1)^r$$

$$\frac{\sin \frac{\pi}{r} \cos \frac{\pi}{r} - \sin \frac{\pi}{r} \cos \frac{\pi}{r}}{\frac{\pi}{r} - \frac{\pi}{r}} = \frac{\frac{1}{r}}{1} = \frac{1}{r}$$

$$\frac{\sin^r \frac{\pi}{r} - \cos^r \frac{\pi}{r} - \sin^r \frac{\pi}{r} + \cos^r \frac{\pi}{r}}{\frac{\pi}{r} - \frac{\pi}{r}} = \frac{1}{r}$$

$$\sin^r m - \cos^r m = (\sin^r m + \cos^r m)(\sin^r m - \cos^r m) \leftarrow \text{سوال 10}$$