

$$x=1 \rightarrow \boxed{x=1} \rightarrow P(1)=1$$

۳ (۱.۵)

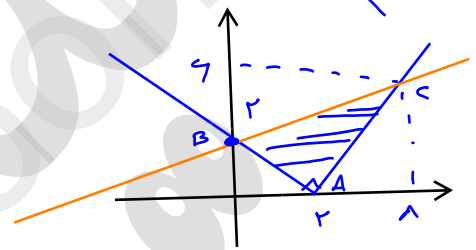
$$x=-1 \rightarrow \boxed{x=-\frac{1}{f}} \rightarrow P(-\frac{1}{f})=d$$

$$R(x) = ax + b \begin{cases} x=1 \rightarrow a+b=1 \\ x=-\frac{1}{f} \rightarrow -\frac{1}{f}a+b=d \end{cases} \Rightarrow \boxed{a=2} \rightarrow R=2x+7$$

$$y = \sqrt{x^2 - 4x + 4} = |x-2|$$

۴ (۱.۹)

$$y = \frac{1}{f}x + 7$$



$$\text{مقطع} \Rightarrow |x-2| = \frac{1}{f}x + 7 \Rightarrow \begin{cases} x \leq 1 \rightarrow y=4 \\ x > 1 \rightarrow y=7 \end{cases}$$

$$\begin{aligned} |AC| &= 4\sqrt{2} \\ |AB| &= 2\sqrt{2} \end{aligned} \Rightarrow S = \frac{1}{f} \times 2\sqrt{2} \times 4\sqrt{2} = \boxed{12}$$

$$f(x) = x + \sqrt{x}$$

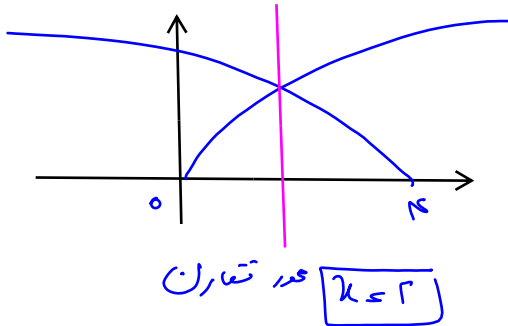
$$(g^{-1} \circ f^{-1})(7) = ?$$

۱ (۱.۷)

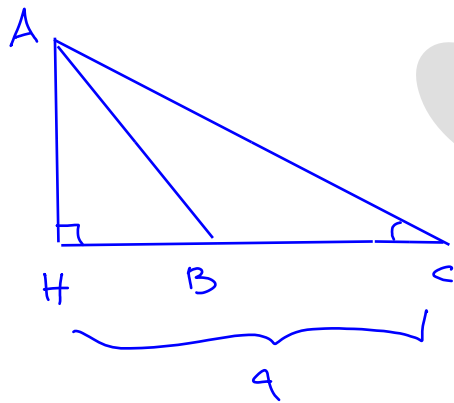
$$g(x) = \frac{4x+7}{1-x}$$

$$f(x) = 7 \rightarrow x + \sqrt{x} = 7 \rightarrow \boxed{x=16}$$

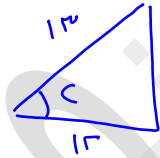
$$\Rightarrow g(x) = 14 \Rightarrow \frac{4x+7}{1-x} = 14 \rightarrow \boxed{x=\frac{7}{2}} \text{ جواب}$$



3 (۱۰۸)



$$\sin \hat{c} = \frac{2}{\sqrt{5}}$$



4 (۱۰۹)

$$\tan \hat{c} = \frac{2}{1}$$

$$\frac{AH}{4} = \frac{2}{1} \Rightarrow AH = \frac{12}{1} = 12$$

$$\sin \alpha = \frac{\sqrt{2}}{10}$$



$$\cos \alpha = \frac{\sqrt{41}}{10} \Rightarrow \cos \alpha = \frac{\sqrt{41}}{10}$$

(۱۱)

3

$$\cos\left(\frac{11\pi}{10} + \alpha\right) = -\frac{\sqrt{2}}{10} \cos \alpha - \frac{\sqrt{2}}{10} \sin \alpha = -\frac{\sqrt{2}}{10} (\sin \alpha + \cos \alpha)$$

$$= -\frac{\sqrt{2}}{10} \left(\frac{\sqrt{2}}{10} + \frac{\sqrt{41}}{10}\right) = \frac{4}{10} = \frac{2}{5}$$

$$\tan^2 x = \cot x \Rightarrow \tan^2 x = \tan\left(\frac{\pi}{2} - x\right)$$

2 (۱۱۱)

$$\Rightarrow \tan x = k\pi + \frac{\pi}{2} - x \Rightarrow kx = k\pi + \frac{\pi}{2} \Rightarrow x = \frac{(2k+1)\pi}{4}$$

$$x = \left\{ \frac{9\pi}{4}, \frac{11\pi}{4}, \frac{13\pi}{4}, \frac{15\pi}{4} \right\} \Rightarrow \text{مجموع} = 9\pi$$

... , {۴, ۵, ۶} , {۲, ۳} , {۱}

۱۱۳ [۳]

حجم آف = $1 + 2 + \dots + 20 = \frac{20 \times 21}{2} = 210 \Rightarrow$ حجم اول = $210 - 20 = 191$
 دست ۲۲۰

حجم جلات $S_{20} = \frac{20}{2} (191 + 210) = 4010$

$f(t) = 2^t \times (\frac{1}{9})^{-\frac{t}{3}}$

۱۱۳ [۱]

$1 = 2^t \times (\frac{1}{9})^{-\frac{t}{3}} \Rightarrow = (\frac{1}{9})^{-\frac{t}{3}}$
 $\Rightarrow \log \frac{1}{9} = -\frac{t}{3} (\log \frac{1}{9})$

$\Rightarrow \frac{1}{2} = \frac{t}{3} \times (1 - 0.149) \Rightarrow t = 39$

$\lim_{n \rightarrow +\infty} \frac{2^{n+1} - 2^{1-2n}}{2^{n+1} + 2^{2n}}$ = $\frac{2^{n+1}}{2^{n+1}} = 1$

۱۱۴ [۱]

$\lim_{n \rightarrow 1} \frac{2^n - \sqrt{k} + a}{2^n - \sqrt{2^{n-1}}} = \frac{0}{0} \xrightarrow{H.o.P} \lim_{n \rightarrow 1} \frac{2 - \sqrt{k} \frac{1}{\sqrt{2}}}{2 - \frac{2}{\sqrt{2^{n-1}}}} = \frac{2 - \frac{\sqrt{k}}{\sqrt{2}}}{2 - \frac{2}{\sqrt{2}}} = \frac{2 - \frac{\sqrt{k}}{\sqrt{2}}}{2 - \sqrt{2}} = -\frac{1}{2}$

۱۱۵ [۲]

$$f(x) = \begin{cases} (x-1)[x] & ; 0 < x < 1 \\ x^2 + ax + b & ; x \leq 0 \leq x \leq 1 \end{cases} \quad \square \quad (116)$$

$$f(1^+) = f(1^-) \rightarrow 1 + 1a + b = 1 \rightarrow a = -\frac{1}{1}$$

$$f(0^+) = f(0^-) \rightarrow 0 = b$$

$$f(x) = \frac{-2x^2 + 3x}{ax^2 + bx + c} \quad \square \quad (117)$$

$$y = -1 \rightarrow \frac{-2}{a} = -1 \rightarrow a = 2$$

$$\begin{cases} x = -1 \\ x = 1 \end{cases} \rightarrow \begin{cases} \text{خرج} = 2(x-1)(x-1) \\ = 2x^2 + 2x - 2 \end{cases}$$

$$\boxed{b=2} \quad \boxed{c=-2}$$

$$f(-1) = \frac{-2-3}{a-b+c} = \frac{-5}{-1-2-2} = \frac{-5}{-5} = 1 \rightarrow \boxed{(1, 2)}$$

$$g(x) = f(\sqrt{1+\tan^2 x}) \Rightarrow g'(x) = \frac{\cancel{x} \tan x (1+\tan^2 x)}{\cancel{x} \sqrt{1+\tan^2 x}} \cdot f'(\sqrt{1+\tan^2 x}) \quad \square \quad (118)$$

$$x = \frac{\pi}{4} \rightarrow g'(\frac{\pi}{4}) = \frac{\sqrt{2} \times 1}{2} \times f'(1) = \frac{\sqrt{2}}{2} \rightarrow f'(1) = \boxed{\frac{1}{\sqrt{2}}}$$

$$y = \sqrt{21 - x^2 + 4x}$$

۱۱۴ [4]

$$\text{شیب} = \frac{f(4) - f(1)}{4 - 1} = \frac{3 - 2}{1} = 1$$

$$\text{پیدا کنی } f'(x) = \frac{-2x + 4}{2\sqrt{21 - x^2 + 4x}} \xrightarrow{\text{بنا}} \sqrt{21 - x^2 + 4x} = x - 2$$

$$\text{توان } 21 - x^2 + 4x = x^2 - 4x + 4$$

$$\Rightarrow 2x^2 - 4x - 1 = 0$$

$$\Rightarrow \Delta = 16 \Rightarrow x = \frac{1 \pm 1.5\sqrt{2}}{2} = 2 + \frac{\sqrt{2}}{2}$$

$$f(x) = \frac{2x - 2}{\sqrt{x}} \Rightarrow f'(x) = \frac{2\sqrt{x} - \frac{1}{\sqrt{x}}(2x - 2)}{x}$$

۱۲۰ [3]

$$x = 2 \rightarrow f(2) = \frac{2}{\sqrt{2}} = \sqrt{2} \text{ پس } y - \sqrt{2} = \frac{2}{\sqrt{2}}(x - 2)$$

$$\rightarrow f'(2) = \frac{1 - 2}{2} = -\frac{1}{2}$$

$$x = 0 \rightarrow (y = 2)$$

$$2x^2 + 2x - 1 = 0 \Rightarrow \begin{cases} \beta = \tan \alpha + \tan \beta = -\frac{2}{1} \\ \rho = \tan \alpha \cdot \tan \beta = -\frac{1}{1} \end{cases}$$

۱۲۱ [4]

$$\tan(\alpha + \beta) = \frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \cdot \tan \beta} = \frac{-\frac{2}{1}}{1 + \frac{1}{1}} = \frac{-2}{2} = -1$$