$a, ar, ar^2 \rightarrow \frac{a}{2}, \frac{ar}{2}, \frac{ar^3}{3}$ گام $\rightarrow \frac{a}{2}, \frac{a}{2}, \frac{a}{2}$

$ar = \frac{a}{2} + \frac{ar^2}{2} \xrightarrow{\times 2} 2r = 1 + r^2 \rightarrow r^2 - 2r + 1 = 0$ $\quad d = 0$

$(r-1)^2 \rightarrow r = 1$

۲ نمره

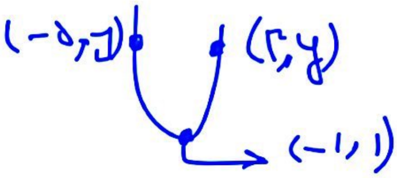
①

$a = -\frac{2}{3} \leftarrow \frac{2a+2}{a} = -1 \Leftarrow 4 - \frac{2a+2}{a} = 5$

$y = a(x+1)^2 + 1 \rightarrow y = ax^2 + 2ax + a + 1$

$y = -\frac{2}{3} + 1 = \frac{1}{3}$ $\qquad \alpha + \beta = S = -2$

$P = \frac{a+1}{a}$



②

$2x^2 - 2x + 1 \rightarrow \frac{(x-1)^2 + x^2}{x^2(x-1)^2} = \frac{160}{9} \rightarrow x^2 - x = t \rightarrow \frac{2t+1}{t^2} = \frac{160}{9}$

$(x^2 - x)^2$

$160t^2 - 18t - 9 = 0 \Rightarrow 160t^2 - 7t - 1 = 0$

$\rightarrow t^2 - 7t - 160 = 0 \rightarrow (t-8)(t+5)$ $\Big|\ \frac{3}{10}, \ -\frac{5}{16}$

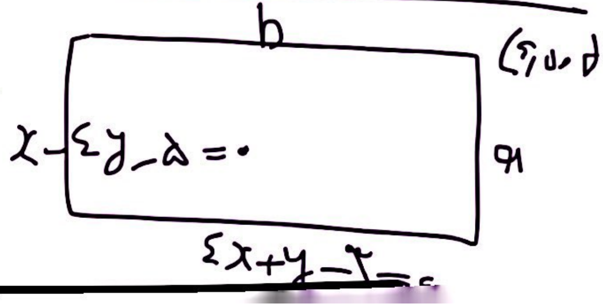
$x^2 - x - \frac{3}{10} = 0 \xrightarrow{\Delta > 0} S = 1$

$x^2 - x + \frac{5}{16} = 0 \xrightarrow{\Delta < 0} S \neq 1$

④

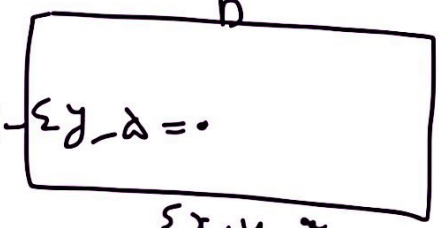
۲ نمره

$m = \frac{1}{4} \qquad m = -4$



$a = \frac{17}{\sqrt{17}} = \sqrt{17}$

187%



$m=\frac{1}{3}$ $m=-3$

$a=\frac{11}{\sqrt{10}}=\sqrt{10}$

$b=\frac{18}{\sqrt{10}}$

گزینه ۱ ⑥

$f^{-1}(x)=12-x \rightarrow f^{-1}(1)=10 \rightarrow f(10)=2$

$2\sqrt{10m-1}=4 \leftarrow 2=\sqrt{10-3\sqrt{10m-1}}$

$10m=10 \rightarrow \boxed{m=1}$

گزینه ۴ ⑦

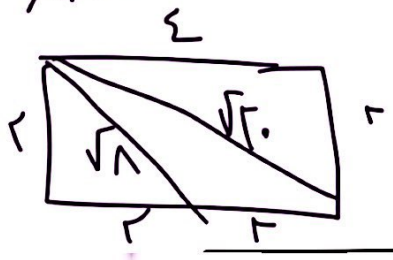
$\log_{\frac{2}{3}}^{2}=\frac{10}{15}=\frac{2}{3}$ $\log_{\frac{3}{2}}^{2}=\frac{10}{15}=\frac{2}{3}$

$AF=A_1\left(\frac{3}{2}\right)^{t/1}$ $\Rightarrow \frac{1}{4}=\left(\frac{3}{2}\right)^{t} \rightarrow 2=\left(\frac{2}{3}\right)^{t}$

$\frac{1}{4}A_1$ $\log_{\frac{3}{2}}^{2}=t\left(\log_{\frac{3}{2}}^{2}-\log_{\frac{3}{2}}^{3}\right)$

$\frac{2}{3}+\frac{1}{2}=t\left(\frac{1}{3}-\frac{1}{2}\right) \Rightarrow \frac{7}{6}=t\times\frac{1}{6}$

$t=\frac{7}{1}\times 6=42$ گزینه ۱ ⑧



$S=8-2-2=\frac{1}{2}\times 2\sqrt{2}\times 2\sqrt{2}\sin\alpha$

$\sin\alpha=\frac{1}{\sqrt{10}}$

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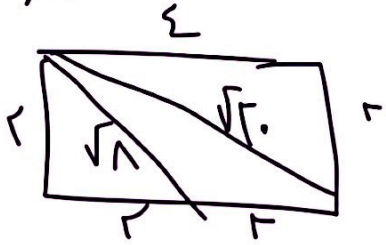
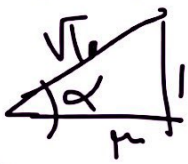


$S = ۸ - ۲ - ۴ = \frac{۱}{۲} \times ۴ \times \sqrt{۲۰} \times ۲ \sin\alpha$

$\sin\alpha = \frac{۱}{\sqrt{۱۰}}$

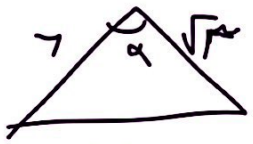


گزینه ۲ $\Rightarrow \cot\alpha = ۳$

۱۰

$S = ۶,۵ = \frac{۹}{۲} \rightarrow \frac{۱}{۲} \times ۷ \times \sqrt{۲۰} \sin\alpha$

$\sin\alpha = \frac{\sqrt{۲}}{۲} \Rightarrow \alpha = ۷۵^\circ, ۱۳۵^\circ$



گزینه ۱

۱۱

$f(x) = a + \frac{b}{۲} \sin(۲(x - \frac{۲\pi}{۳}))$ $\quad c=۱$

$f(x) = a + \frac{b}{۲} \cos ۲cx$ $\quad T = \pi = \frac{۲\pi}{۲c}$

$f(x) = ۱ - ۲\cos ۲cx = ۰ \Rightarrow \cos ۲cx = \frac{۱}{۲}$

$۲x = \frac{\pi}{۳} \rightarrow ۲x = ۲\pi - \frac{\pi}{۳} \rightarrow x = \frac{\pi}{۶}, \frac{۵\pi}{۶}$

$\frac{۵\pi}{۶} - \frac{\pi}{۶} = \frac{۲\pi}{۳}$ گزینه ۲

۱۲

$\cos x - \sin x = t \rightarrow t^۲ = ۱ - \sin ۲x$

$۳\sqrt{۶}\, t^۲ + mt - ۶\sqrt{۶} = ۰ \Rightarrow ۳\sqrt{۶}(۱ - \sin ۲x) + m\sqrt{\frac{۲}{۳}} + m\sqrt{\frac{۳}{۲}} - ۶\sqrt{۶} = ۰$

$m\sqrt{\frac{۲}{۳}} = ۲\sqrt{۶} \Rightarrow \frac{m}{\sqrt{۳}} = ۲\sqrt{۳} \Rightarrow m = ۶$

$\frac{\sqrt{۲}}{۲}\cos x - \frac{\sqrt{۲}}{۲}\sin x = \frac{۱}{\sqrt{۳}} \Rightarrow \cos x - \sin x = \sqrt{\frac{۴}{۳}} = t$

گزینه ۳

۱۳

$m^2 - n - ۵ > -۱ + ۲n - m^2$

$۲m^2 - ۲m - ۴ > ۰$

$-\frac{۱}{۲}$, $\frac{۴}{۲} = ۲$

	$-\frac{1}{2}$		2	
	+	−	+	

۰ و ۱ و ۲ و ۳

۱ گزینه

۱۳

$$\frac{\frac{a}{c}}{-\frac{b}{a}} = \frac{-\frac{b}{a}}{\frac{c}{a}} \Rightarrow a = \frac{b^2}{a} \rightarrow a^2 = b^2$$

$$\boxed{a = \pm b}$$

$$f = \frac{ax+b}{cx+d} \rightarrow \frac{-dx+b}{cx-a} \Rightarrow g = \frac{cx+d}{ax+b}$$

$$g^{-1} = \frac{-bx+d}{ax-c}$$

۳ گزینه

۱۵

$ج: n \rightarrow n^+ \Rightarrow |x^n - (-n-1)| = |۲n+1| = ۲n+1$

$n^- \Rightarrow x^n - (n-1) + k = 1 + k$

$\boxed{k = ۲n}$

$(-n)^+ : |x^{-n} - (n-1)| = |-۲n+1| = ۲n-1$

$(-n)^- : x^{-n} - (-n-1) + k = k+1$

$۵ = 1 + k \rightarrow k = ۴$, $۳ = 1 + k \rightarrow k = ۲$

$k = |1+1| = ۲$, $k = |-۲| = ۲$

۲ گزینه

۱۶

$$g(x) = \frac{f(x) - 1}{x}$$

$x(۲\cos x)(-1+\sin x)$

(۱۶)

$$g(x)=\frac{f(x)-1}{x}$$

$$\lim_{x\to 0} g(x)=f'(0)$$

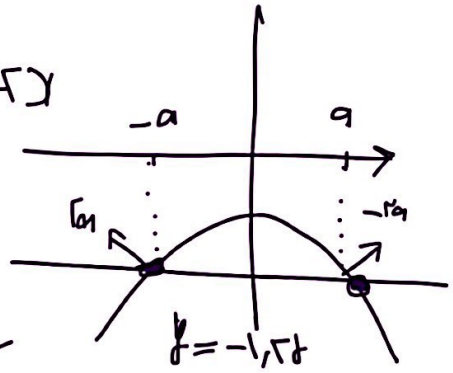
$$2\left(\frac{2\cos x}{(1+\sin x)^2}\right)\left(\frac{-1+\sin x}{1+\sin x}\right)$$

$$2\times 2\times -1=-4$$

(۱۷)

$$y=-x^2-1 \to y'=-2x$$

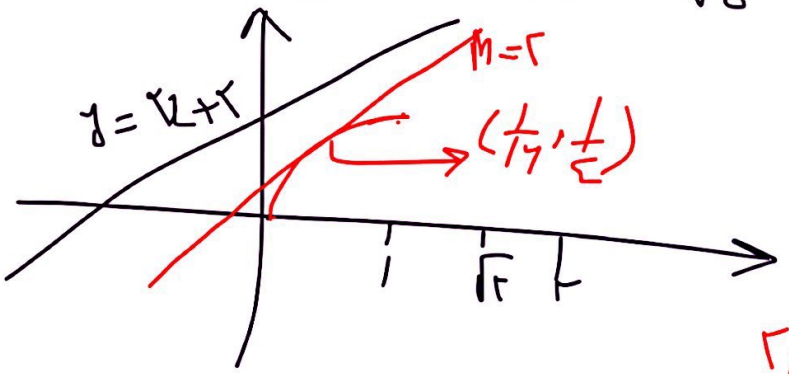
$$-4a^2=-1 \to a=\frac{1}{2}$$



(۱۸)

$$y'=\frac{1}{2\sqrt{x}}=2 \to \sqrt{x}=\frac{1}{4} \Rightarrow x=\frac{1}{16}$$

$$d=\frac{\frac{1}{4}-\frac{1}{8}-2}{\sqrt{5}}=\frac{\frac{1}{8}-2}{\sqrt{5}}=\frac{\frac{15}{8}}{\sqrt{5}} \Rightarrow \frac{3}{8}\sqrt{5}$$



(۲۰)