

تاریخ امتحان:

دبیرستان غیر دولتی همدان

کلاس: یازدهم ریاضی

به نام خدا

امضای تصحیح حسابان ۱:

$$1.2, 1.4, \dots, 99.2$$

$$a_n = 1.2 + (n-1) \times 2 \Rightarrow 99.2 - 1.2 = 2(n-1) \Rightarrow$$

$$\frac{199.2}{2} = n-1 \Rightarrow \boxed{n=100}$$

$$S_n = \frac{n}{2} [2a_1 + (n-1)d] = \frac{100}{2} [2(1.2) + \frac{199.2 \times 2}{199.2}] =$$

$$78 \times 1.91 = 1483.8$$

$$S_n = \frac{n}{2} (a_1 + a_n) = \frac{100}{2} (1.2 + 99.2) = 78 \times 1.91 = 1483.8$$

$$\text{الف) } |x-1| = x^2 - x - 1 \Rightarrow \begin{cases} x \geq 1 \Rightarrow x-1 = x^2 - x - 1 \Rightarrow x^2 - 2x = 0 \Rightarrow x(x-2) = 0 \Rightarrow x=2 \end{cases}$$

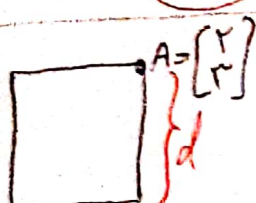
$$\begin{cases} x < 1 \Rightarrow -(x-1) = x^2 - x - 1 \Rightarrow x^2 - 1 = 0 \Rightarrow x^2 - 2 = 0 \Rightarrow x = \pm \sqrt{2} \end{cases}$$

$$x = \sqrt{2} \quad x = -\sqrt{2}$$

جواب سؤال: $\{2, -\sqrt{2}\}$

$$\text{ب) } \sqrt{x+2} + 2 = x \Rightarrow \sqrt{x+2} = x-2 \Rightarrow x+2 = x^2 - 4x + 4 \Rightarrow$$

$$x^2 - 5x + 2 = 0 \Rightarrow (x-2)(x-3) = 0 \Rightarrow x=2 \quad x=3$$



$$d = \frac{|x^2(x) - x^2(x) - 9|}{\sqrt{9+14}} = \frac{18}{5} = 3.6$$

$$d = 3 \times 3 = 9$$

$$f(x) = \sqrt{x-1}$$

$$g(x) = \sqrt{2-x}$$

$$\text{الف) } (f \circ g)(x) = f(g(x)) = f(\sqrt{2-x}) = \sqrt{\sqrt{2-x} - 1}$$

$$\text{ب) } D_f: [1, +\infty) \quad D_g: (-\infty, 2]$$

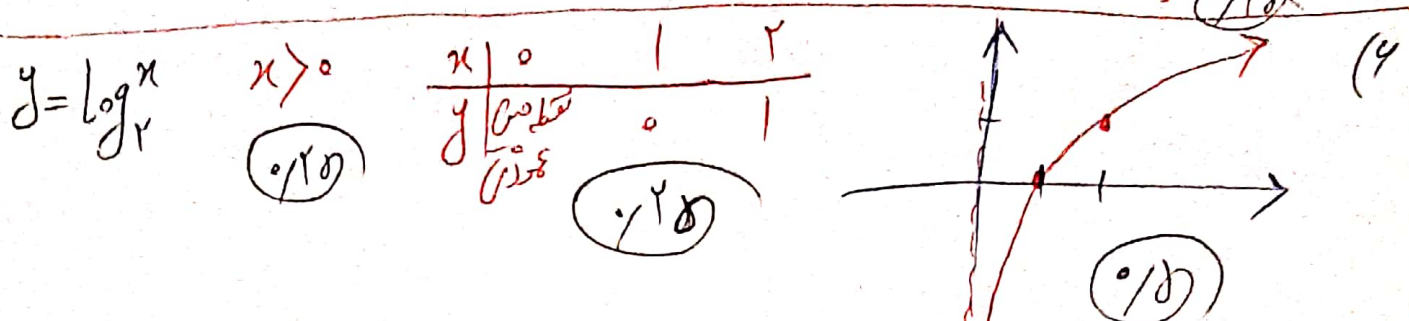
$$D_{f \circ g} = \{x \in D_g \mid g(x) \in D_f\} = \{x \in (-\infty, 2] \mid \sqrt{2-x} \in [1, +\infty)\} = (-\infty, 1]$$

$$f(x) = \sqrt{x+1} - 2 \Rightarrow \sqrt{x+1} = y+2 \Rightarrow x+1 = (y+2)^2 \Rightarrow x = (y+2)^2 - 1 \quad (8)$$

$$f(x) = (x+2)^2 - 1 \quad (9/10) \quad x+1 \geq 0 \Rightarrow x \geq -1 \Rightarrow D_f = [-1, +\infty) \Rightarrow D_{f^{-1}} = [-2, +\infty) \quad (9/10)$$

$$R_f = [-2, +\infty) \quad R_{f^{-1}} = [-1, +\infty) \quad (9/10)$$

این رسم کلی توان به دانه دبردی پی برد



$$\log_2 \frac{1}{16} + \log_2 \sqrt[3]{\frac{1}{8}} + \log_2 \frac{1}{10} = -4 + \frac{1}{3} + (-1) = -4 + \frac{1}{3} = -\frac{11}{3} \quad (9/10)$$

$$\log(x-2) = 2 \log 2 - \log(x-2) \Rightarrow x-2 = \frac{2^2}{x-2} \Rightarrow x-2 = \frac{4}{x-2} \Rightarrow (1)$$

$$(x-2)(x-2) = 4 \Rightarrow x^2 - 4x + 4 - 4 = 0 \Rightarrow x^2 - 4x = 0 \Rightarrow \Delta = 16 - 4(1)(0) = 16$$

$$x = \frac{4 \pm \sqrt{16}}{2} = \frac{4 \pm 4}{2} = \frac{8}{2} = 4 \quad (9/10)$$

$$\frac{4 + 2\sqrt{8}}{2} = \frac{4 + 2\sqrt{8}}{2} = 2 + \sqrt{8} \quad (9/10)$$

$$\frac{4 - 2\sqrt{8}}{2} = \frac{4 - 2\sqrt{8}}{2} = 2 - \sqrt{8} \quad (9/10)$$

پس: $(x-2)(x-2) = 4 \Rightarrow x^2 - 4x + 4 - 4 = 0 \Rightarrow x = 2 \pm \sqrt{8}$

$\log(x-2) + \log(x-2) = \log 2^2$

$x = 2 + \sqrt{8}$
 $x = 2 - \sqrt{8}$

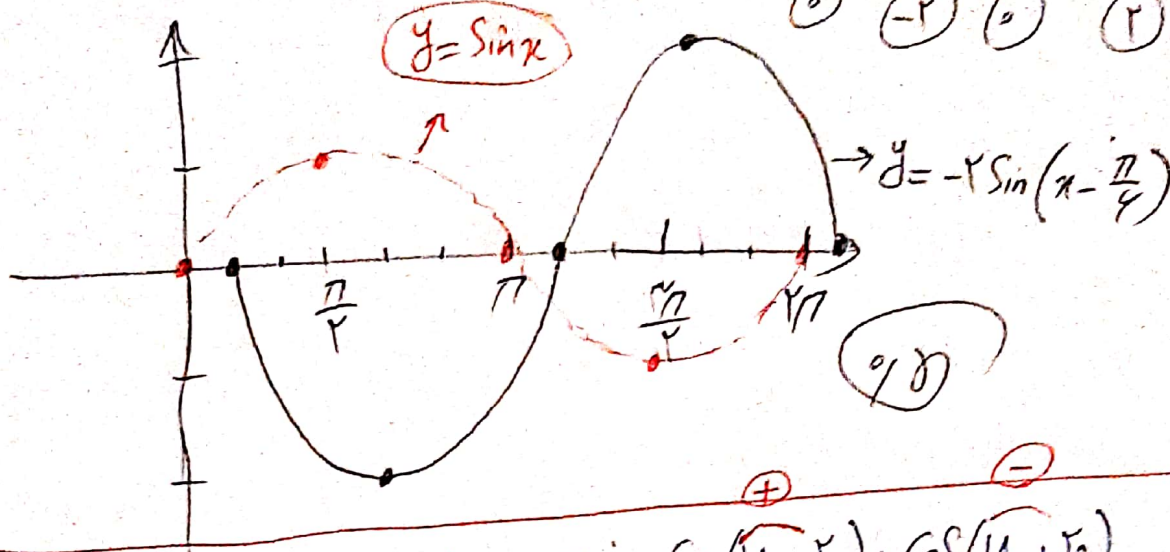
الف) $\sin 18^\circ = \sin(45^\circ - 27^\circ) = \sin 45^\circ \cos 27^\circ - \cos 45^\circ \sin 27^\circ = \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2} \times \frac{1}{2} = \frac{1}{2} - \frac{\sqrt{2}}{4} = \frac{2 - \sqrt{2}}{4}$ (9)

ب) $\cos 27^\circ = \frac{1 + \cos 2(27^\circ)}{2} = \frac{1 + \cos 54^\circ}{2} = \frac{1 + \frac{\sqrt{2}}{2}}{2} = \frac{2 + \sqrt{2}}{4} \Rightarrow$

$\cos 27^\circ = \frac{2 + \sqrt{2}}{4}$ (9/10)

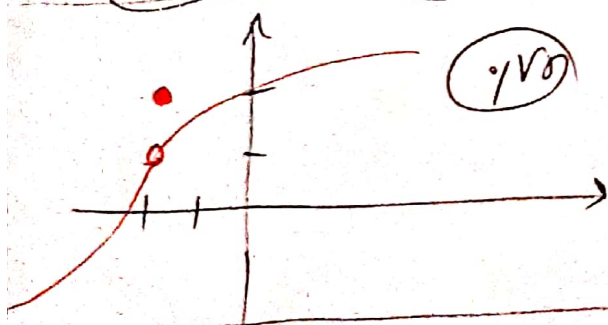
$$y = -2 \sin\left(x - \frac{\pi}{4}\right) \Rightarrow y = \sin x$$

x	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	π	$\frac{5\pi}{4}$	$\frac{3\pi}{2}$	$\frac{7\pi}{4}$	2π
y	0	1	0	-1	0	1	0	-1	0



$$\tan \alpha = a \Rightarrow \frac{\sin \alpha + \cos \alpha}{\cos \alpha + \sin \alpha} = \frac{\sin(\alpha_0 + \alpha_0) + \cos(\alpha_0 + \alpha_0)}{\cos(\alpha_0 + \alpha_0) + \sin(\alpha_0 + \alpha_0)} = 1$$

$$\frac{\sin \alpha - \cos \alpha}{-\sin \alpha + \cos \alpha} = \frac{\frac{\sin \alpha}{\cos \alpha} - \frac{\cos \alpha}{\cos \alpha}}{-\frac{\sin \alpha}{\cos \alpha} + \frac{\cos \alpha}{\cos \alpha}} = \frac{\tan \alpha - 1}{-\tan \alpha + 1} = \frac{a-1}{-a+1}$$



برای هر شکل دیکود درستی مرتبه علق می‌باشد
فقط مقدار تابع با جواب حد نباید یکسان باشد

$$\text{الف) } \lim_{x \rightarrow -1} \frac{\sqrt{x+2} - 1}{x^2 + 2x} \cdot \frac{\sqrt{x+2} + 1}{\sqrt{x+2} + 1} = \lim_{x \rightarrow -1} \frac{x+2-1}{x(x+1)(\sqrt{x+2}+1)} = \frac{1}{-2(2)} = -\frac{1}{4}$$

$$\text{ب) } \lim_{x \rightarrow 0} \frac{1 - \cos(2x)}{x^2} = \lim_{x \rightarrow 0} \frac{2 \sin^2(x)}{x^2} = \frac{2x^2}{x^2} = 2$$

$$\text{ج) } \lim_{x \rightarrow 1} \frac{x^2 + 2x - 3}{x^2 - 1} = \lim_{x \rightarrow 1} \frac{(x-1)(x+3)}{(x-1)(x+1)} = \frac{1(1)+3}{1+1} = \frac{4}{2} = 2$$

$$a = \frac{v}{g}$$

9/25

०/२७

1/10

$\Rightarrow$ $\left[\frac{1}{2} \right]$

”بايان“

دانشگاه امیرکبیر، تهران، راه حلای درست، نمونه علق می شود