تمرین‌ها

۱۸,۵

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(1)

$$y=\frac{-1}{3}x^2+\frac{2}{5}x+1 \longrightarrow \frac{-b}{2a}=\frac{-2}{5}\times\frac{-3}{2}=\frac{+3}{5}$$

$$\frac{-1}{3}\times\frac{9}{25}+\frac{2}{5}\times\frac{3}{5}+1=\frac{-3}{25}+\frac{6}{25}+1$$

$$\frac{-b}{2a}=4 \longrightarrow y=-3$$

$$\frac{3}{25}+1=\frac{28}{25}$$

(2)

$$x=\frac{3}{5}\longrightarrow 4 \Rightarrow 4-\frac{3}{5}=\frac{17}{5}$$

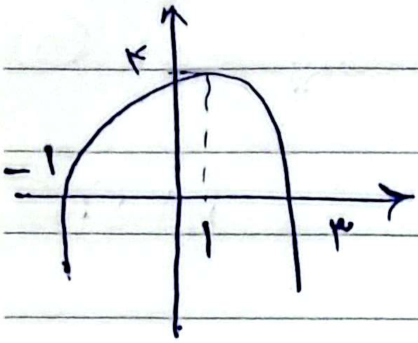
$$y=\frac{28}{25}\longrightarrow 3 \Rightarrow 3-\frac{28}{25}=\frac{75-28}{25}=\frac{47}{25}$$

$$y=-\frac{1}{3}\left(x-\frac{17}{5}\right)^2+\frac{2}{5}\left(x-\frac{17}{5}\right)+1+\frac{47}{25}=0$$

$$-\frac{1}{3}\left(x^2+\frac{289}{25}-\frac{34}{5}x\right)+\frac{2}{5}x-\frac{34}{25}+\frac{72}{25}\xrightarrow{\times -3}$$

$$x^2+\frac{289}{25}-\frac{34}{5}x-\frac{6}{5}x+\frac{102}{25}-\frac{216}{25}=0$$

$$x^2-\frac{40}{5}x+\frac{175}{25}\Rightarrow x^2-8x+7 \rightarrow (x-1)(x-7)\rightarrow 1,7$$




2

$y=1-2f(3x+2)$

2

$\to a(x-3)(x+1) \Rightarrow ax^2-2ax-3a$

$(1,4) \to a-2a-3a=4 \to -4a=4 \Rightarrow a=-1$

$-x^2+2x+3 \longrightarrow y=1-2\left(-(3x+2)^2+2(3x+2)+3\right) \Rightarrow$

$1-2(-9x^2-4-12x+6x+4+3) \Rightarrow 1-2(-9x^2-6x+3) \Rightarrow$

$1+18x^2+12x-6 \Rightarrow 18x^2+12x-5 \Rightarrow \frac{-b}{2a}=\frac{-12}{36} \Rightarrow -\frac{1}{3}$

$18\times\frac{1}{9}+12\times-\frac{1}{3}-5 \Rightarrow 2-4-5 \Rightarrow -7$ $\quad -7\times-\frac{1}{3}=\frac{7}{3}$

3

$y=3-\sqrt{2x} \longrightarrow 3-\sqrt{2(x+1)} \longrightarrow -\left(3-\sqrt{2(x+1)}\right)+5$

2

$y=-3-\sqrt{2x+2}+5 \Rightarrow y=2-\sqrt{2x+2}=\frac{7}{4} \Rightarrow$

$\frac{3}{2}=\sqrt{2x+2} \Rightarrow \frac{9}{4}=2x+2 \Rightarrow \frac{1}{4}=2x \longrightarrow x=\frac{1}{8}$

4

$f+g$ دامنه $\to D_f\cap D_g \quad D_{f(x-1)} \Rightarrow x-1=4$

$x=5$

$x-1=a \longrightarrow x=a+1$

2

*

$D_{g(x+1)} \Rightarrow x+1=-1 \Rightarrow x=-2$ $\quad (a+1,5]$

$x+1=b \Rightarrow x=b-1 \quad [-2,b-1)$

$g_{(x+1)}+f_{(x-1)}$ دامنه $\Rightarrow D_{f(x-1)}\cap D_{g(x+1)} \Rightarrow (-2,5)$

$a+1=-2 \Rightarrow a=-3 \longrightarrow -3-6=-9$

$b-1=5 \Rightarrow b=6$

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$D_{f(\frac{x}{4}+1)} = [-3,5] \rightarrow D_{f(x+1)} = [\frac{-3}{4}, \frac{5}{4}] \rightarrow$

۲

$D_{f(x)} = [\frac{-1}{4}, \frac{7}{4}]$ $R_{f(\frac{x}{4}+1)} = [-1,2] \xrightarrow{\times 2} [-2,4] \xrightarrow{-3}$

$[-5,1]$

$R_{2f(x)-3} = [-5,1] \longrightarrow [0,\sqrt{5}]$

۶

$a<0 \leftarrow [x]$ نمودار

طبق شکل نمودار

$x=1/a$ باشد $\Rightarrow \frac{1}{4} \longrightarrow \frac{1}{a^2}[1] = \frac{1}{4} \Rightarrow a=\pm 2$ $a<0$

۲

$a=-2$

$0 \leq ax < 1 \leftarrow 0 \leq x < \frac{1}{a}$

$b=1$ فاصله‌ی بین خطوط $\frac{1}{2}$ پس

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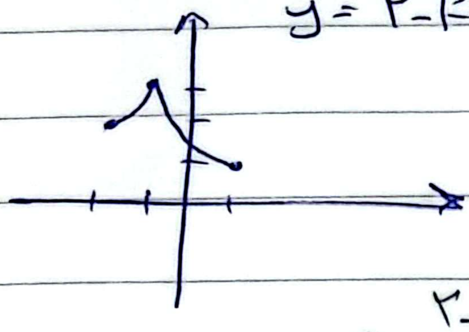
$y = \log_{۲}^{x} \longrightarrow \log_{۲}^{x+۲} \longrightarrow -\log_{۲}^{x+۲} + ۳$    ۷

۲

$\longrightarrow -\log_{۲}^{-x+۲} + ۳ = g_{(x)} \longrightarrow g_{(-۱۴)} \Rightarrow -\log_{۲}^{۱۶} + ۳ = -۱$

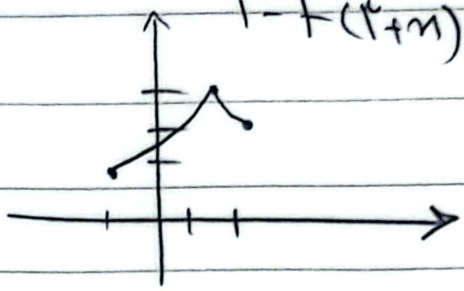
$g_{(-۶۲)} = -\log_{۲}^{۶۴} + ۳ = -۳ \qquad -۳ - ۱ = -۴$

$y = ۲ - f(۲ - x)$



$\rightarrow$

$۲ - f(۲ + x)$

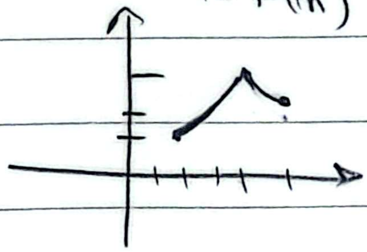


۱

۲

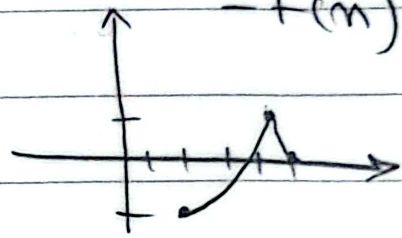
$\rightarrow$

$۲ - f(x)$



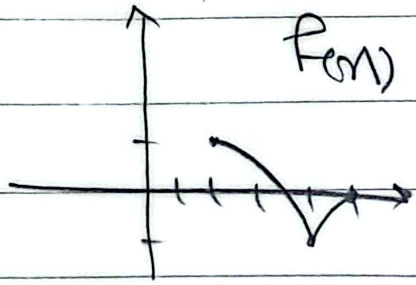
$\rightarrow$

$-f(x)$



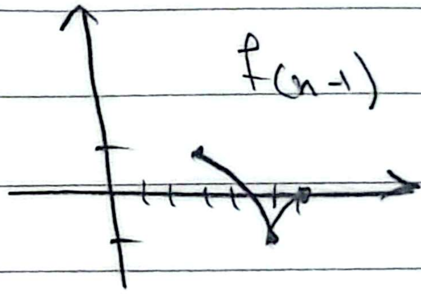
$\Rightarrow$

$f(x)$



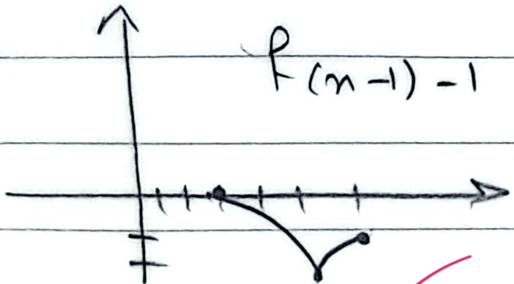
$\Rightarrow$

$f(x-1)$



$\Rightarrow$

$f(x-1) - 1$



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$$f(x)=\left|\frac{x+1}{2x+1}\right| \longrightarrow f(x)=\left|\frac{(x-2)+1}{2(x-2)+1}\right| \Rightarrow$$ ⑨

۱و۵

$$g(x)=\left|\frac{x-1}{2x-4}\right|+1 \Rightarrow x+1+\left|\frac{x-1}{2x-4}\right|<0 \Rightarrow$$

$$x+1+\frac{x-1}{2x-4}=\frac{2x^2-4}{2x-4}<0 \qquad x+1+\frac{x-1}{3-2x} \qquad x+1+\frac{x-2}{2x-4}=\frac{2x^2-4}{2x-4}<0$$

$$\frac{-(x-1)^2}{3-2x}<0$$

$$x\in(-\infty,-\sqrt{2})\cup(\cancel{1,\tfrac{3}{2}})\cup(\cancel{\tfrac{3}{2},\sqrt{2}})$$

$$\left|\frac{x-1}{2x-4}\right|<-1-x \rightarrow$$ قطعا باید مثبت باشد پس جواب دگر معلق است $\rightarrow x<-1$

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$$g(x)=\sqrt{28f(x)-f^2(x)} \Rightarrow g(x)=\sqrt{f(x)(28-f(x))}$$ ⑩

①

$$f(x)=(x-2)^3+27=0 \Rightarrow (x-2)^3=-27 \rightarrow x=-1$$

$$-(x-2)^3-27+28=0 \Rightarrow -(x-2)^3+1=0 \Rightarrow (x-2)^3=1 \Rightarrow$$

$$x-2=1 \Rightarrow x=3$$

$-1 \quad 3$: $- \mid + \mid -$

$\leftarrow -1, 0, 1, 2, 3$ پنج

$$f(x)=k(x-2)^3+27 \xrightarrow{(0,0)} k=\frac{27}{8} \rightarrow 0\le f(x)\le 28$$

$$f(x)=0 \rightarrow x=0 \quad , \quad f(x)=28 \rightarrow x=\frac{8}{3} \qquad 0\le x\le\frac{8}{3}$$ ۳ عدد صحیح

Senobar