

الف) $D_f = [-4, 2]$

$f(x) \rightarrow f(x-2) \rightarrow f(3x-2)$

$[-4, 2] \xrightarrow{+2} [-6, 4] \xrightarrow{\times 3} \left[\frac{-6}{3}, \frac{4}{3} \right]$

ب) $f(3x-2) \quad D_f = [-4, -2]$

$f(x) \xrightarrow{\times 3} f(3x) \xrightarrow{-2} f(3x-2)$

$-4 \leq x \leq -2 \xrightarrow{\times 3} -12 \leq 3x \leq -6$

$\xrightarrow{-2} -14 \leq 3x-2 \leq -8$

$f(x) = x + \sqrt{x-2}$

$f(x+2) = x+2 + \sqrt{x+2-2} \Rightarrow y = y-2 + \sqrt{y-4}$

$y = x = \text{نیمساز ناحیه اول و سوم} \quad y_1 = y_2 \quad y = \sqrt{y-4}$

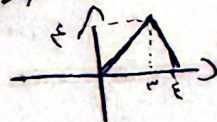
$f(x-2) \Rightarrow x = y-2 + \sqrt{y-4}$

$y = 1$

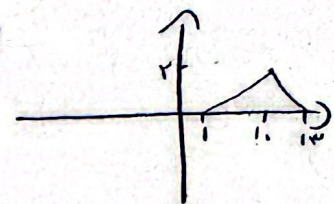
$g(x) = 2f(3x+1)$

$R_g = [0, 4] \Rightarrow R_f = [0, 2]$

$D_g = [0, 4] \Rightarrow D_f \Rightarrow 0 \leq x \leq 4 \Rightarrow 0 \leq 3x+1 \leq 13 \Rightarrow 1 \leq 3x+1 \leq 13$



$S_{\Delta} = \frac{4 \times 4}{2} = 8$



$y = f(x) \Rightarrow f(2) = -3$

$y = a + 2f\left(\frac{x-a}{2}\right)$

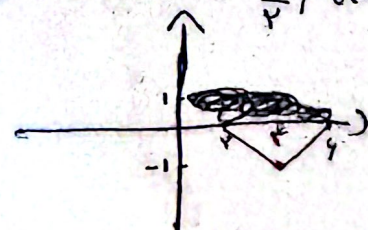
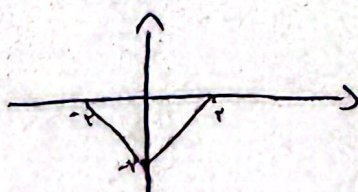
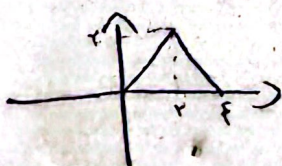
$a = -22 \quad 2a+14 = -44+14 = -30$

If $x = 4+a \Rightarrow y = -4+a$

A' نقطه $\rightarrow 2x+1 = a + 2f\left(\frac{x-a}{2}\right)$

$2(4+a)+1 = 2a+14$

$y = -f(x-2) \rightarrow f(x) \rightarrow f(x+4) \rightarrow f(-x+4) \rightarrow \frac{1}{2}f(x)$



$f(x_{n+1}) \rightarrow \begin{array}{c|c|c} 0 & 1 & 2 \\ \hline - & + & - \end{array}$
 $f(x) \rightarrow -1, 2, 0 = 0$
 $f(x_{n+1}) \rightarrow 0, 1, 2 = 0$
 $y = \sqrt{-(x+2)f(x_{n+1})}$
 $[-2, 0] \cup [1, 2]$

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$g(x) = |2(x+k) - 3| + 1 - 3 = |2x + 2k - 3| - 2$

$f(x) = g(x)$
 $f(x) = |2(x+k) - 3| + 1 - 3 = |2x + 2k - 3| - 2$
 $|2k - 3| - 2 = 4 \Rightarrow 2k - 3 = \pm 6 \Rightarrow k = \frac{9}{2}, \frac{3}{2}$

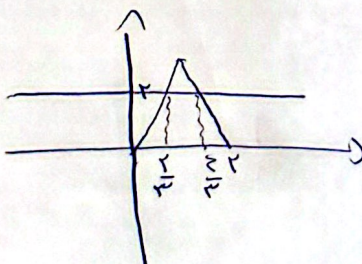
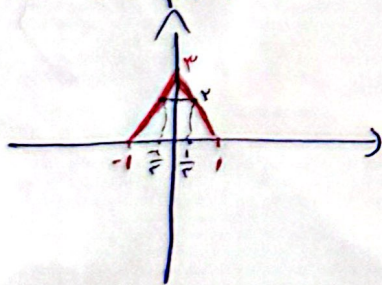
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$f(x) = \frac{2x-1}{x+1} \rightarrow -f(x) = \frac{1-2x}{x+1} \rightarrow -f(\frac{x}{r}) = \frac{r-2x}{r+x} = \frac{r-2x}{r+x}$
 $\frac{r-2x}{r+x} + k = \frac{2x-1}{x+1} \Rightarrow (r+kx+r-2x)(x+1) = (2x-1)(r+x)$

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$(k-2)x + (k-2)x + r + 3k = 0$
 $\Rightarrow k = 4$

$y_1 = -f(\frac{x}{r}) + 2$



$\frac{r}{r} \times \frac{r}{r} = \left[\frac{r}{r} \right]$

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$f(x) = |x-a| - 2$

$\frac{(a-2)^2}{2} + \frac{4x^2}{2} = \frac{9}{2}$

$a^2 - 4a + 4 = 1$

$(a-1)(a-3) = 0$

$a = 1, 3 \Rightarrow$

طبی شکل

$a = 3$

$f(x) = |x-3| - 2$

$f(\frac{1}{r}) = |\frac{1}{r} - 3| - 2$

$\left[\frac{r}{r} \right]$

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