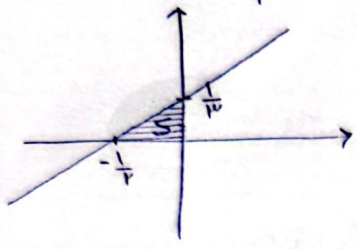


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نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ... کلاس ...

$$2y = 3x - 1 \rightarrow x = \frac{2y+1}{3} \rightsquigarrow y = \frac{2}{3}x + \frac{1}{3}$$



$$S = \frac{1}{2} \times \frac{1}{2} \times \frac{1}{3} = \frac{1}{12} \quad \checkmark$$

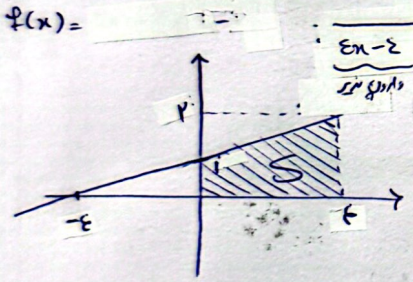
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الف) $y = x^2 - 2x + 3 \rightarrow y = x^2 - 2x + 1 + 2 \rightarrow y = (x-1)^2 + 2$ $x \in [1, +\infty)$ $\text{cut } |$ $x = 1 + \sqrt{y-2} \rightsquigarrow y = 1 + \sqrt{x-2}$ $(x \geq 2) \quad \checkmark$

ب) $y = x^2 - 2x + 3 \rightarrow y = x^2 - 2x + 1 + 2 \rightarrow y = (x-1)^2 + 2$ $x \in [3, +\infty)$ $| \frac{3}{4}$ $x = 1 + \sqrt{y-2} \rightsquigarrow y = 1 + \sqrt{x-2}$ $(x \geq 4) \quad \checkmark$

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$$f(x) = 2x - \sqrt{14 - 2x(2-x)} \rightarrow f(x) = 2x - \sqrt{2x^2 - 14x + 14} \rightarrow y = 2x - 2|x-2|$$



$$S = \frac{(1+2) \times 4}{2} = 4 \quad \checkmark$$

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$$y = \frac{x}{\sqrt{x^2-5}} \rightarrow x^2-5 > 0 \quad x \in (-\infty, -\sqrt{5}) \cup (\sqrt{5}, +\infty)$$

$$y' = \frac{1}{\sqrt{x^2-5}} - \frac{x^2}{(x^2-5)^{3/2}} \rightarrow y' = \frac{(x^2-5) - x^2}{(x^2-5)^{3/2}} = \frac{-5}{(x^2-5)^{3/2}}$$

هم علامه $x \rightarrow \sqrt{5}^+$ $y \rightarrow +\infty$ $y \in (1, +\infty)$ $x \rightarrow -\sqrt{5}^-$ $y \rightarrow -\infty$ $y \in (-\infty, -1)$
 $y = \frac{x}{\sqrt{x^2-5}} \rightarrow x\sqrt{y^2-5} = y \quad x^2y^2 - y^2 = 5x^2$
 $y = \sqrt{\frac{5x^2}{x^2-1}}$ $D_{y^{-1}} \in (-\infty, -1) \cup (1, +\infty)$

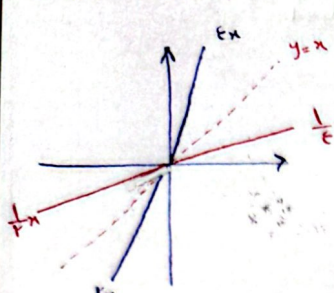
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$$y = x^2 - 2kx + k \rightarrow \frac{-b}{2a} = \frac{2k}{2} = k \quad y = -x^2 + 4x + 3 \rightarrow \frac{-b}{2a} = \frac{-4}{-2} = 2$$

$$x = 2 \rightarrow 2 - 4 + k = k - 2 \quad x = 2 \rightarrow -2 + 4 + 3 = 5$$

$$k - 2 \leq 5 \rightarrow k \leq 7$$

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$f(x) = 3x + x $ 	$f^{-1}(x) = \begin{cases} (a+b)x & x \geq 0 \\ (a-b)x & x < 0 \end{cases} = \begin{cases} \frac{1}{2}x & x \geq 0 \\ \frac{1}{4}x & x < 0 \end{cases}$ $\begin{cases} a+b = \frac{1}{2} \\ a-b = \frac{1}{4} \end{cases}$ $2a = \frac{3}{4} \Rightarrow a = \frac{3}{8}, b = -\frac{1}{8} \Rightarrow ab = -\frac{3}{64}$	۶
$f(x) = \frac{3x+2}{x+m} \xrightarrow{f(r)=-1} -1 = \frac{3r+2}{r+m} \Rightarrow r+m = -1$ $y = f \circ f^{-1}(x) + f^{-1}(x) = f(f(x)) + f(x)$ $\frac{3\left(\frac{3x+2}{x-3}\right) + 2}{\left(\frac{3x+2}{x-3}\right) - 3} + \frac{3x+2}{x-3} = \frac{x^2+2}{x-3}$ $x = \frac{x^2+2}{x-3} \Rightarrow x^2 - 3x = x^2 + 2 \Rightarrow 3x = -2 \Rightarrow x = -\frac{2}{3}$	$m = -3 \Rightarrow f(x) = \frac{3x+2}{x-3}$ $f(x) = f^{-1}(x) \leftarrow \text{کتابخانه}$	۷
$f(3-2x) = x - g\left(\frac{x}{p}\right)$ $f(3-2x) = x - \epsilon = -2$ $f(3-2x) = -2 \Rightarrow f^{-1}(-2) = 3-2x$ $\epsilon g^{-1}(\epsilon) + f^{-1}(-2) = \epsilon\left(\frac{x}{p}\right) + 3-2x = 2x + 3 - 2x = 3$	$g^{-1}(\epsilon) = \frac{x}{p} \leftarrow g\left(\frac{x}{p}\right) = f\left(\frac{x}{p}\right)$	۸
$y = \frac{2x-13}{1-x} \rightarrow -y = \frac{-2x-13}{1+x}$ $\frac{2x+13}{x-1} = \frac{-2x-13}{1+x}$ $2x^2 + 14x - 13 = 0$ $x + \beta = -\frac{b}{a} = -1, 4$ $f^{-1}(u) = \frac{u+4}{u-2} \rightarrow \frac{u+4}{u-1} = \frac{u+4}{u-2} \rightarrow u^2 - 3u - 4 = 0 \rightarrow S = -\frac{b}{a} = 3$	$y = \frac{2x+13}{x-1} - 3 = \frac{2x+4}{x-1}$	۱
$f(x) = x + f[x] = y \rightarrow f^{-1}(y) \rightarrow x = y + f[y]$ $(f-g)(x) = x + f[x] - x + g[x]$ $y = u + f[u]$ $y = u + f\left[\frac{y}{a}\right] \rightarrow u = y - f\left[\frac{y}{a}\right]$ $(f-g)(x) = u + f[x] - u + f[x] = f, g[x]$	$x = y + f[x + f[x]]$ $x = y + f[x] + f[f[x]]$ $f^{-1}(y) = g(y) = y - f_0[x]$ $[y] = [u] + f[u] = a[u] - [u] = \frac{[y]}{a}$	۱۰