

تکلیف ۲

مسئله اول

$$-2 \leq x \leq 2 \Rightarrow -2 \leq 3x - 2 \leq 2 \Rightarrow -2 \leq 3x \leq 4 \quad (1) \text{ انت}$$

$$-\frac{2}{3} \leq x \leq \frac{4}{3} \quad \text{Def}(f(x)) = \left[-\frac{2}{3}, \frac{4}{3}\right]$$

$$-2 \leq x \leq -2 \Rightarrow -12 \leq 3x \leq -4, -14 \leq 3x - 2 \leq -8$$

$$\text{Def}(f(x)) = [-14, -8]$$

(2)

ابتدا دو دایره
برای $y = x - 2 + \sqrt{x - 4}$
برای $y = x$ و $f(x) = x - 2 + \sqrt{x - 4}$ در نقطه تقاطع
نقطه تقاطع $y = x$ و $y = x - 2 + \sqrt{x - 4}$

$$x - 2 + \sqrt{x - 4} = x \Rightarrow \sqrt{x - 4} = 2 \Rightarrow x - 4 = 4 \Rightarrow x = 8$$

$$y = x \Rightarrow y = 8$$

نقطه A

محلول $f(x) = y$ خط $y = x$ در نقطه $y = 8$ و $x = 8$ و طول ۱ قطری است.

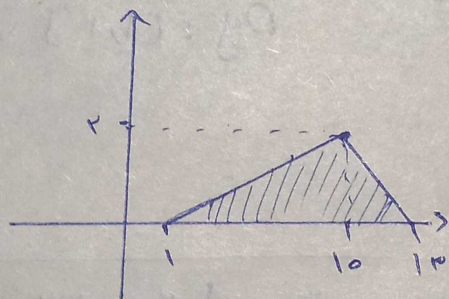
$$[f(x) = y' \Rightarrow f^{-1}(y') = x']$$

(3) - از راه دایره

$$0 \leq x \leq 4 \Rightarrow 0 \leq 3x \leq 12$$

$$1 \leq 3x + 1 \leq 13$$

و چون عرض نقاط نیز نسبت است
نسبت دایره



$$S = (13 - 1) \times 2 \times \frac{1}{2}$$

$$S = 12$$

(4)

$$A(2, -3)$$

$$A'(x, y)$$

$$\Rightarrow \frac{x - a}{2} = 2 \Rightarrow x - a = 4 \Rightarrow a + 4 = x$$

$$y = x - 1$$

$$A'(x, x - 1)$$

$$x = a + 4$$

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

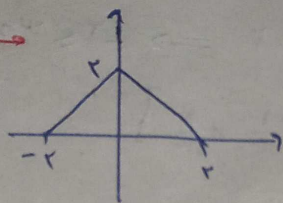
$$y = a + 2f(2) = a - 4$$

$$2a = a - 4 \Rightarrow a = -4$$

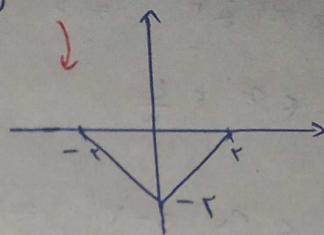
4. نکته

توجه داشته باشید

$$y = -f(x) \rightarrow$$

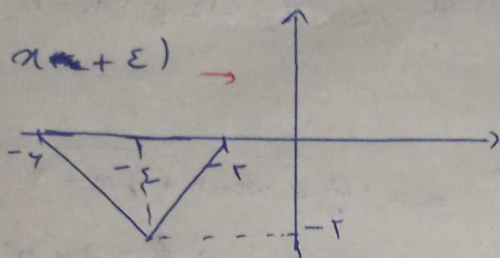


$$y = f(x)$$

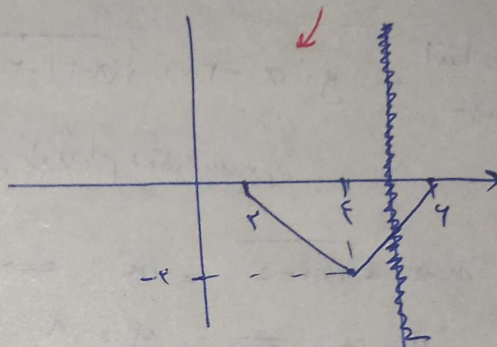


(a)

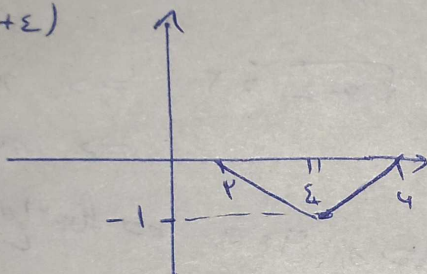
$$y = f(x + \varepsilon) \rightarrow$$



$$y = f(-x + \varepsilon)$$



$$y = \frac{1}{r} f(-x + \varepsilon)$$



$$y = \sqrt{-(n+r)} f(r_{n-1})$$

$$\Rightarrow n+r \geq 0 \quad n \geq -r$$

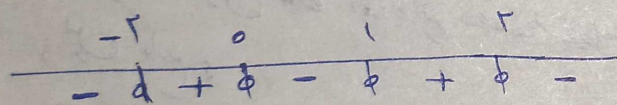
$$f(-1) \geq 0 \quad f(r) \geq 0 \quad f(0) \geq 0$$

$$r_{n-1} \geq -1 \quad r_{n-1} \leq r \quad r_{n-1} \geq 0$$

$$n \geq 0$$

$$n \geq 1$$

$$n \geq r$$



$$Dy \in [1, r] \cup [-r, 0]$$

$$-(n+r) f(r_{n-1}) \geq 0$$

$$\Rightarrow (n+r) f(r_{n-1}) \leq 0$$

$$f(x) = g(x) = |r(n+k) - r| + 1 - r = |r_{n+rk} - r| - r$$

(v)

$$g(x) = f(x) = |r_{n+rk} - r| - r = |r_n - r| + 1$$

و چون f و g در $x=0$ به هم می‌رسند و $f(0) = 1$ و $g(0) = 1$ پس $f(0) = g(0) = 1$

$$|rk - r| - r = |-r| + 1 \Rightarrow |rk - r| \geq r + 1 \Rightarrow rk - r \geq r$$

$$rk - r \geq r \quad k \geq \frac{r}{r}$$

$$\left[k \geq \frac{r}{r} \right] \Leftrightarrow k \geq 1$$

تکلیف ۲

سوال اول

$$y = \frac{r_{n-1}}{n+1}$$

قریند نسبت بطل
فا

$$y = -\frac{r_{n-1}}{n+1} \Rightarrow y = \frac{1-r_n}{n+1}$$

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طول ساق برابر

$$y = \frac{1 - \frac{r_n}{r}}{\frac{n}{r} + 1} \Rightarrow y = \frac{\frac{r-r_n}{r}}{\frac{n+r}{r}} = \frac{r-r_n}{n+r}$$

$$\frac{r-r_n}{n+r} = \frac{r-r_n}{n+r}$$

کک طر برابر

$$y = \frac{r-r_n}{n+r} + k$$

$$\frac{r-r_n}{n+r} + k = \frac{r_{n-1}}{n+1}$$

$$\Rightarrow \frac{r-r_n + k(n+r)}{n+r} = \frac{r_{n-1}}{n+1} \Rightarrow$$

$$r_n - r_n^2 + k(n^2 + r^2 + 2kr) + r - r_n = r_{n-1}^2 - n + 4k - r$$

$$n^2(k-r) + 2n(k-1) + 4 + 3k = 0$$

$$14k(k-1)^2 - 5(4+3k)(k-r) = 0$$

$$5(k^2 - 2k + 1) - 5(k+r)(k-r) = 0$$

$$5k^2 - 10k + 5 - 5k^2 + 5r^2 + 4k + 2r = 0$$

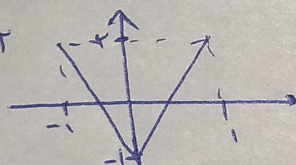
$$k^2 - 2k + 2r = 0$$

$$k - 2(2r) = 0 \Rightarrow$$

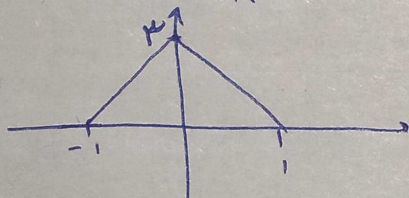
صاف
ریشه دارد

صاف و جذباتی هیچ
مقدار

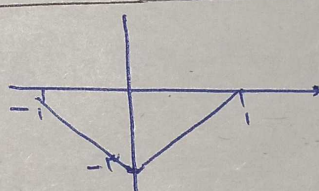
$$y = -f(x) + r$$



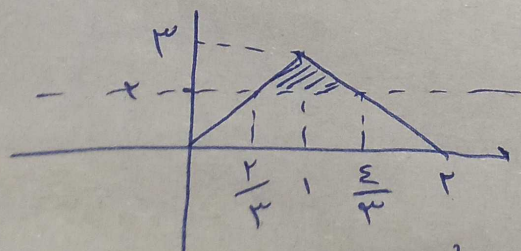
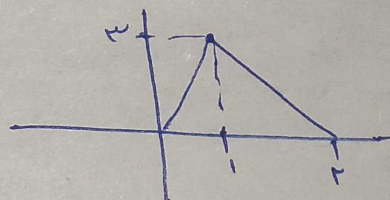
$$y = f(x)$$



$$y = -f(x)$$



$$y = f(x-1)$$



مساحت

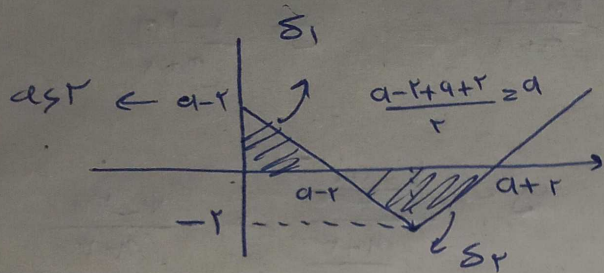
$$\frac{1}{r} = \frac{n}{r} \Rightarrow n = \frac{r}{r}$$

$$\text{مساحت } S = \frac{r}{r} \times 1 \times \frac{1}{r} = \frac{1}{r}$$

ثابت

سید زلال

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$$f(a) = |a - a| - r$$

$$f(a) = -r$$

$$\delta_1 + \delta_r = \frac{q}{r} \Rightarrow \frac{1}{r}(a-r)^r + \epsilon(+r) \frac{1}{r} = \frac{q}{r}$$

$$\frac{1}{r}(a-r)^r = \frac{1}{r} \Rightarrow (a-r)^r \geq 1 \quad \begin{matrix} a-r \geq 1 \\ a-r \geq -1 \end{matrix}$$

$$a-r > 0 \quad \boxed{a > r} \quad \begin{matrix} 0 \leq a < r \\ 0 \leq a < 1 \end{matrix}$$

$$f\left(\frac{1}{r}\right) = \left|\frac{1}{r} - r\right| - r = \frac{1}{r} - r = -\frac{10}{9}$$