

۲. آفرین

نسبت آخر منتهی بازدهم A تکلیف ۲

۱- $r(a+1)(a+2) \leq 3a - 2 + a \rightarrow 10a \leq -11 \quad a \leq -\frac{11}{10}$

۲- $n_1, n_2 \in (2-\sqrt{3})(2+\sqrt{3}) \leq 1 \leq \sqrt{n_1} \sqrt{n_2} \rightarrow \frac{1}{\sqrt{n_1}} \leq \sqrt{n_2}, \frac{1}{\sqrt{n_2}} \leq \sqrt{n_1}$

۳- $f(n_1) + f(n_2) \leq \sqrt{n_1} + \sqrt{n_2} + \frac{1}{\sqrt{n_1}} + \frac{1}{\sqrt{n_2}} \leq 2(\sqrt{n_1} + \sqrt{n_2}) + 2 \rightarrow (\sqrt{n_1} + \sqrt{n_2})^2 \leq n_1 + n_2 + 2\sqrt{n_1 n_2} + 4$

۴- $f(x) - 3f(-x) \leq 2x^2 - 2x \quad 2f(x) - 9f(-x) \leq 4x^2 - 4x$
 $-3f(x) + 2f(-x) \leq 2x^2 + 2x \quad -9f(x) + 4f(-x) \leq 12x^2 + 4x$
 $-2f(x) \leq 2x^2 + 2x \rightarrow f(x) \leq -x^2 - x$

۵- $\frac{x \leq 0}{x \leq -1} \rightarrow f(0) \leq m-1$
 $\left\{ \begin{array}{l} 2f(0) \leq m-1 \\ 4f(0) \leq 2m+1 \end{array} \right\} \rightarrow \left\{ \begin{array}{l} 2f(0) \leq m-1 \\ 4f(0) \leq 2m+1 \end{array} \right\} \rightarrow \left\{ \begin{array}{l} 2f(0) \leq m-1 \\ 2f(0) \leq m+0.5 \end{array} \right\}$

۶- $\frac{2x^2 - 12x + 2}{2} \leq 2x - 12 + \frac{2}{x}$
 $f(x) \leq 2x - 9$
 $f(-1) \leq -9$

۷- $f(x) + f(\frac{1}{x}) \leq ax + b + \frac{a}{x} + b \rightarrow x(ax + \frac{1}{x}) + b = 2x^2 + 2x + b$
 $\Rightarrow (2x^2 + 2x + b) - (2x^2 + 2x + b) = 0$
 $a \leq 2, b \leq -12$

۸- $D_f: (-\infty, 1] \quad f(x) \leq -(1-x)\sqrt{1-x} \leq -(1-x)^{\frac{3}{2}}$
 $D_g: (-\infty, 1] \quad g(x) \leq -(1-x)^{\frac{3}{2}} \rightarrow f(x) \leq g(x) \rightarrow \text{برابرند}$

۹- $f(x) \leq x\sqrt{x} \leq x^{\frac{3}{2}}$
 $g(x) \leq \sqrt{x} \leq x^{\frac{1}{2}}$
 $f(x) \leq g(x) \rightarrow \text{برابرند}$

۱۰- $x \geq 0 \Rightarrow D_f \quad x \geq 0 \Rightarrow D_g$
 $n \geq 0 \Rightarrow [\sqrt{n} - \lfloor \sqrt{n} \rfloor] \leq [\sqrt{n}] - \lfloor \sqrt{n} \rfloor \leq 1$
 $n - n \leq 0$
 $\rightarrow \text{برابرند}$

۱۱- $\frac{2+1}{2-1} \leq \frac{3+2}{2-3} \leq \frac{4}{2-4}$
 $\frac{3}{1} \leq \frac{5}{-1} \leq \frac{4}{-2}$
 $3 \leq -5 \leq -2$
 $\rightarrow \text{تکلیف شده}$

۱۲- $f(x) \leq f(0) \leq f(2) \leq 1$
 $|x| \leq 2 \quad x \leq \pm 2$
 $|x| \leq 1 \quad x \leq 0$
 $|x| \leq 3 \quad x \leq \pm 3$

۱۳- $h(x) \leq \{(-\frac{1}{2}, -1), (-\frac{1}{2}, 0), (0, 0), (0, 1), (1, 1), (1, 0)\}$