

$$\{(r-1)(m-2)\} \Rightarrow m=3$$

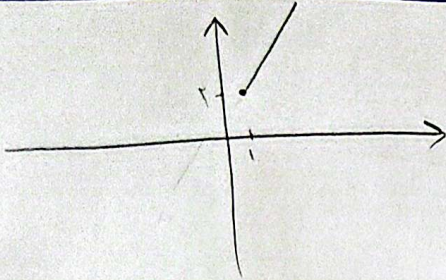
$$\{(r-1)(r-n-1)\} \Rightarrow n^2-n-2 \Rightarrow n^2-n-2 \Rightarrow n < -1$$

$$\{(1-1)(n-2)\} \Rightarrow n \neq -1 \Rightarrow n=2$$

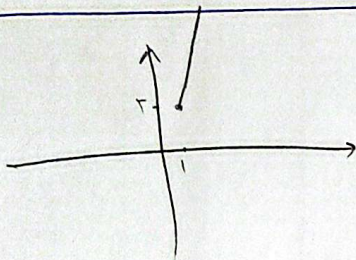
$$\{(r-1)(m-2)\} \Rightarrow m=2$$

$$\{(1-1)(a-2)\} \Rightarrow a=1$$

$$\{(1-1)(1-2)(2-2)(2-n)\} \Rightarrow n \in \mathbb{R} - \{1, 2, 3\}$$



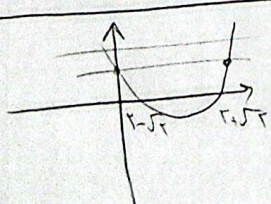
$$n+a < 2 \Rightarrow 1+a < 2 \Rightarrow a < 1$$



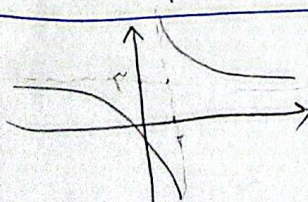
$$n+a-1 < 2 \Rightarrow a-1 < 2 \Rightarrow a < 3$$

$$\begin{cases} y = n_1^2 + 2 \\ y = n_2^2 + 2 \end{cases} \Rightarrow n_1^2 + 2 = n_2^2 + 2 \Rightarrow n_1^2 = n_2^2 \Rightarrow n_1 = n_2$$

$$n = y^2 + 2 \Rightarrow y^2 = n - 2 \Rightarrow y = \sqrt{n-2}$$



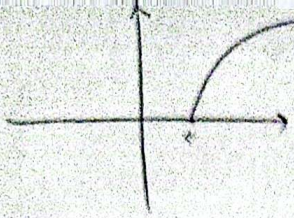
$$y = n^2 - (m+2) \Rightarrow n = \frac{6 \pm \sqrt{16-4}}{2} = 2 \pm \sqrt{3}$$



$$n = \frac{y+1}{y-2} \Rightarrow y = \frac{2n+1}{n-2}$$

$$y = \frac{m+1}{n+2} = \frac{2(n+2)}{n+2} = 2$$

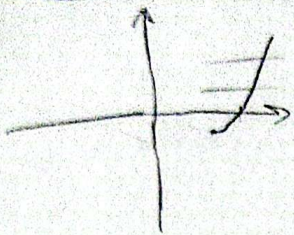
$$y = 2$$



یک کمانه

$$n\sqrt{y-1} \Rightarrow n^2(y-1) = y \Rightarrow n^2 y - n^2 = y \Rightarrow y(n^2 - 1) = n^2 \Rightarrow y = \frac{n^2}{n^2 - 1}$$

الف ۴



یک کمانه $n^2 - 2n + 1 = (n-1)^2$

ب

$$n_{min} = -\frac{b}{2a} = -\frac{1}{2} = -\frac{1}{2}$$

$$n = y^2 - 2y + 1 \Rightarrow y^2 - 2y + 1 = n \Rightarrow y = \frac{2 \pm \sqrt{4 - 4(1-n)}}{2} = 1 \pm \sqrt{n}$$

$$\Rightarrow y = 1 + \sqrt{n+1}$$

$$n = y + \sqrt{y} \Rightarrow \sqrt{y} = n - y \Rightarrow n^2 = y^2 + y + 2y\sqrt{y} = y^2 + y + 2y(n-y) = y^2 + y + 2ny - 2y^2 = -y^2 + 2ny + y$$

$$\Rightarrow y^2 - (1+2n)y + n^2 = 0 \Rightarrow y = \frac{1+2n \pm \sqrt{(1+2n)^2 - 4n^2}}{2} = \frac{1+2n \pm \sqrt{4n+1}}{2} = n + \frac{1}{2} \pm \sqrt{n + \frac{1}{4}}$$

$$\Rightarrow \begin{cases} a=1 \\ b=\frac{1}{2} \\ c=-\frac{1}{2} \end{cases} \Rightarrow a+2b+c = 1+1-1=1$$

$$\left. \begin{aligned} y &= \frac{n_1}{\sqrt{n_1^2-2}} \\ y &= \frac{n_2}{\sqrt{n_2^2-2}} \end{aligned} \right\} \Rightarrow \frac{n_1}{\sqrt{n_1^2-2}} = \frac{n_2}{\sqrt{n_2^2-2}} \Rightarrow \frac{\sqrt{n_1^2-2}}{n_1} = \frac{\sqrt{n_2^2-2}}{n_2} \Rightarrow \frac{n_1^2-2}{n_1^2} = \frac{n_2^2-2}{n_2^2} \Rightarrow \frac{n_1^2-2}{n_1^2} = \frac{n_2^2-2}{n_2^2}$$

$$\Rightarrow \frac{-2}{n_1^2} = \frac{-2}{n_2^2} \Rightarrow \frac{1}{n_1^2} = \frac{1}{n_2^2} \Rightarrow n_1^2 = n_2^2 \Rightarrow n_1 = \pm n_2$$

یک یکسانیت

$$\sqrt{n} - 1 = -\frac{1}{a} \Rightarrow \sqrt{n} = \frac{1}{a} \Rightarrow n = \frac{1}{a^2} = g^{-1}\left(-\frac{1}{a}\right)$$

$$\frac{n}{1+|n|} = -\frac{1}{a} \Rightarrow -1-2|n| = an \xrightarrow{n>0} -1-2n = an \Rightarrow \sqrt{n} = -\frac{1}{a} \Rightarrow n = -\frac{1}{a^2} \Rightarrow \frac{-\frac{1}{a^2}}{1+\frac{1}{a^2}} = -\frac{1}{a} \Rightarrow \frac{-1}{a^2+1} = -\frac{1}{a} \Rightarrow \frac{1}{a^2+1} = \frac{1}{a} \Rightarrow a^2+1 = a \Rightarrow a^2 - a + 1 = 0 \Rightarrow a = \frac{1 \pm \sqrt{1-4}}{2} = \frac{1 \pm i\sqrt{3}}{2}$$

$$\Rightarrow f\left(-\frac{1}{a}\right) = -\frac{1}{a} \Rightarrow f\left(-\frac{1}{a}\right) + g^{-1}\left(-\frac{1}{a}\right) = -\frac{1}{a} + \frac{1}{a^2} = \frac{-a+1}{a^2} = \frac{-\frac{1 \pm i\sqrt{3}}{2} + 1}{\left(\frac{1 \pm i\sqrt{3}}{2}\right)^2} = \frac{\frac{1 \mp i\sqrt{3}}{2}}{\frac{1 - 1 \mp i\sqrt{3} - 3}{4}} = \frac{\frac{1 \mp i\sqrt{3}}{2}}{\frac{-2 \mp i\sqrt{3}}{4}} = \frac{2(1 \mp i\sqrt{3})}{-2 \mp i\sqrt{3}} = \frac{2(1 \mp i\sqrt{3})(-2 \pm i\sqrt{3})}{(-2 \mp i\sqrt{3})(-2 \pm i\sqrt{3})} = \frac{2(-2 \pm i\sqrt{3} + 2i\sqrt{3} - 3)}{4 - 3} = \frac{2(-5 \pm 4i\sqrt{3})}{1} = -10 \pm 8i\sqrt{3}$$

$$n \leq \sqrt{y-1} \Rightarrow n^2 \leq y-1 \Rightarrow y \geq n^2+1 = f(n) \Rightarrow g(n) \leq n^2+1+\sqrt{n^2+1}$$

$$n^2+1+\frac{\sqrt{n^2+1}}{t} \leq 12 \Rightarrow t^2+t=12 \Rightarrow t^2+t-12=(t-3)(t+4)=0 \Rightarrow t=3$$

$$\Rightarrow \sqrt{n^2+1} \leq 3 \Rightarrow n^2+1 \leq 9 \Rightarrow n^2 \leq 8 \Rightarrow n \leq 2$$