

$$f(n) = \frac{n^2 - fn + 3 + b(n+a)}{n+a} = n$$

$$f(n) = n^2 - fn + 3 + b(n+a)$$

$$n^2 + an = n^2 - fn + 3 + b(n+a)$$

$$an = (b-f)n + 3 + ab \Rightarrow b-f = a, ab = -3$$

$$ab = -3 \xrightarrow{a=b-f} (b-f)b = -3$$

$$b^2 - fb + 3 = 0 \Rightarrow (b-1)(b-3) = 0$$

$$1 \Rightarrow a = -3, b = 1$$

$$\frac{n^2 + 2n^2 - n - 3}{n^2 - 1} = \frac{(2n^2 - 1)(n+3)}{(n^2 - 1)} = n+3$$

$$f(n) = g(n) \Rightarrow n+3 = n+3 \Rightarrow 3=3$$

$$g \frac{an+3}{n+b} = n+3$$

$$\frac{n+3}{n+1} = \frac{a+3}{b+1}$$

$$\frac{3-a}{b-1} = 1 \Rightarrow 3-a = b-1$$

$$a+b = 4$$

$$b+c = 1, a+3 = 3, b=1$$

$$b = \frac{1}{2}, a = \frac{3}{2}$$

$$a = 1, b = 1$$

$$b+c = 2, a = 2$$

$$f(n) : f(n-3a) \geq 0 \Rightarrow f(n) \geq 3a \Rightarrow n \geq \frac{3}{f}a$$

$$g(n) : b-fn \geq 0 \Rightarrow b \geq fn \Rightarrow \frac{b}{f} \geq n$$

$$f(n) - g(n) = 2(\sqrt{f(n-3a)} + k - 1) - 2(\sqrt{b-fn} + 3k) = 2k - 2 - 6k = -4k$$

$$2a - \frac{b}{f} - k = 2 - 2 + 1 = 1 \Rightarrow k = -1$$

$$f(n) : m-n \geq 0 \Rightarrow m \geq n$$

$$g(n) : 2n+3 \geq 0 \Rightarrow n \geq -\frac{3}{2}$$

$$f-g(3) = 4\sqrt{2} \Rightarrow \sqrt{V-(3^2)} + n - \sqrt{2(3)+2} = 4\sqrt{2}$$

$$\Rightarrow n = 4\sqrt{2} + \sqrt{2} - 2 \Rightarrow n = 5\sqrt{2} - 2$$

$$m+n = V + 5\sqrt{2} - 2 = 5 + 5\sqrt{2}$$



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