

الف) $(n+1)(n+1) = n^2 + 2n + 1$ ✓
 ب) $n^2 + 2n + 1$ ✓
 ج) $n^2 + 2n + 1$ ✓

$D_f = D_g = \mathbb{R} \quad f(n) = g(n) = 0$

$D_f = \mathbb{R} - [0, \frac{1}{r}) \quad D_g = \mathbb{R} - [0, 1) \quad D_f \neq D_g$

$D_f = \emptyset \quad D_g = (0, +\infty) \quad D_f \neq D_g$

$D_f = D_g = \mathbb{R} \quad f(n) = g(n)$

$\begin{cases} f(n) + g(n) = n^2 + n + 1 \\ f(n) - g(n) = n^2 - n + 1 \end{cases} \Rightarrow \begin{cases} 2f(n) = 2n^2 + 2 \\ f(n) = n^2 + 1 \end{cases}$

$f(n) = n^2 + 1 \quad g(n) = n$

الف) $(n + \sqrt{n^2 - r}) \times (n - \sqrt{n^2 - r})$

$D_f = D_g = \mathbb{R} - (-r, r)$



$n^2 - n\sqrt{n^2 - r} + n\sqrt{n^2 - r} - n^2 - r = -r$
 $f \times g = r$

الف) $am - bn = -\frac{rv}{r}$
 $m = \frac{rv}{r} \quad n = -\frac{rv}{r}$
 $a = \frac{1}{r} \quad b = -r$

$$e) \frac{bx+r}{ax+b} = c \rightarrow bx+r = cax+bc \rightarrow \begin{cases} b=ac \\ bc=r \end{cases} \rightarrow c = \pm \frac{1}{r}$$

$$c = \frac{1}{r} \rightarrow b=r \rightarrow a = -\frac{1}{r} \rightarrow \frac{ab}{c} = -r$$

$$c = -\frac{1}{r} \rightarrow b=-r \rightarrow a = \frac{1}{r} \rightarrow \frac{ab}{c} = r$$

$$\{(2,1), (2,1), (-1,-1), (0,0)\} \quad f = \{(-1,2), (2,2), (2,-2), (0, \frac{1}{2})\}$$

$$\{(-1,-2), (2,1), (2,2), (0,0)\}$$

0.5

$$\frac{fg}{f+g} = \{(-1,2), (2,1), (3,3)\}$$

$$d = -1 \quad \checkmark \quad a = -1 \quad \Rightarrow \quad d + c = -1 + 2 = 1$$

$$c + d = 1$$

$$c = a - 2b \Rightarrow c = -1 - 2b \Rightarrow c = -1 + 2 = 1$$

$$c = 1$$

$$2a - 2b = 1 \Rightarrow -2 - 2b = 1 \Rightarrow -2b = 3 \Rightarrow b = -\frac{3}{2}$$

9) چون دامنه و یک عضو است بنابر این دامنه f باید یک عضو باشد.

$$\Delta = 0 \rightarrow 1 - fm = 0 \rightarrow fm = 1 \rightarrow m = \frac{1}{f}$$

$$f(m) = \sqrt{-(m - \frac{1}{f})^2} \rightarrow a = \frac{1}{f}, b = 0$$

$$a + b = \frac{1}{f}$$

$$x^2 + 4x + b = 0 \xrightarrow{\Delta=0} 16 - 4b = 0 \rightarrow b = 4$$

$$f(x) = \frac{2x+a}{(x+3)^2}, \quad g(x) = \frac{r}{x-2} \rightarrow c = -2$$

$$f(x) = g(x) \rightarrow \frac{2x+a}{(x+3)^2} = \frac{r}{x+3} \rightarrow \frac{2(x+3)}{(x+3)^2} = \frac{r}{x+3} \rightarrow a = 4$$

$$a + b + c = 12$$

وقت نکردم حل کنم: