

$$F(x) = \sqrt{x + \epsilon \sqrt{x - \epsilon} + \epsilon - \epsilon} \Rightarrow$$

$$F(x) = \sqrt{x - \epsilon + \epsilon \sqrt{x - \epsilon} + \epsilon} = \sqrt{(\sqrt{x - \epsilon} + \epsilon)^2}$$

$$g(x) = \sqrt{x - \epsilon \sqrt{x - \epsilon} + \epsilon - \epsilon} \Rightarrow \sqrt{x - \epsilon - \epsilon \sqrt{x - \epsilon} + \epsilon}$$

$$\sqrt{(\sqrt{x - \epsilon} - \epsilon)^2} \Rightarrow f(x) + g(x) =$$

$$|\sqrt{x - \epsilon} + \epsilon| + |\sqrt{x - \epsilon} - \epsilon| = 2\sqrt{x - \epsilon}$$

$$\begin{aligned} & \text{for } x \geq 0 \quad a = 0 \\ & \frac{a+b}{c} = \frac{-1}{\epsilon} \quad b = \epsilon \\ & \quad \quad \quad c = -\epsilon \end{aligned}$$

$$F(x) = \frac{x + \epsilon}{x^2 - \epsilon x + \epsilon} = \frac{x + \epsilon}{(x - \epsilon)(x - 1)}$$

$$\frac{g(x)}{F(x)} = \frac{1}{\epsilon} \quad \frac{g(0)}{F(0)} = \frac{\epsilon}{\frac{\epsilon}{\epsilon}} = \epsilon$$

$$\frac{g}{F} = \left\{ \left(\epsilon, -\frac{1}{\epsilon} \right) (0, \epsilon) \right\}$$

$$a) f(x) = \left\{ \left(\frac{1}{x}, 2 \right) \left(\frac{x}{2}, -1 \right) (2, 2) \left(\frac{-1}{x}, 9 \right) \right\}$$

$$b) f(x) = \left\{ (1, 2) (-1, 2) (\sqrt{x}, -1) (-\sqrt{x}, -1) (2, 2) (-2, 2) \right\}$$

$$c) xg^2(x) + 1 \Rightarrow g^2(x) \left\{ (-2, 9) (1, 1) (3, 4) \right\}$$

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

$$xg^2(x) = \left\{ (-2, 18) (1, 2) (3, 1) (-1, 0) \right\}$$

$$xg^2 + 1 \Rightarrow \left\{ (-2, 19) (1, 3) (3, 9) (-1, 1) \right\}$$

$$d) \frac{x^2}{g} \Rightarrow x^2 \left\{ (1, 4) (2, -1) (3, 4) (-1, 2) \right\}$$

$$\frac{x^2}{g} = \left\{ (1, 4) \left(\frac{x}{2}, \frac{-4}{x} \right) (-1, \frac{4}{x}) \right\}$$

سریع تره

$$F(n) \{ (1, 1) (1, 1) (1, 1) (-1, 0) \} - \epsilon$$

$$F+g \Rightarrow \{ (1, 1) (1, 1) (-1, 1) \}$$

$$I \quad F \rightarrow \begin{matrix} \forall n \geq 0 \\ n \geq 0 \end{matrix} \quad \sqrt{r_n - n} \Rightarrow \sqrt{r_n} \geq n$$

$$n \neq r$$

$$\begin{matrix} 0 & r \\ + & | - | + \end{matrix} [0, r]$$

$$\cap \Rightarrow [0, r] - \{r\}$$

$$g \Rightarrow n \in \mathbb{Z} \rightarrow 0 \quad n \notin \mathbb{Z} \rightarrow -1$$

$$\frac{f(n)}{g(n)+1} \Rightarrow \exists n \in \mathbb{Z} \quad p \in \mathbb{Z}, 1, r \}$$

$$\sqrt{-(n^2 - an + \epsilon)} \Rightarrow \sqrt{-(n-1)(n-\epsilon)} \quad \frac{1}{-1 \pm \epsilon} - \epsilon$$

$$p_p = [1, \epsilon]$$

$$\frac{f(n)}{g(n)} \Rightarrow \{ (1, \frac{0}{\epsilon}) (1, \frac{\sqrt{r}}{1}) (\epsilon, \frac{0}{\epsilon}) \}$$

$$a) \Rightarrow g = (n-1)^2 + 1 \Rightarrow (n-1)^2 = g-1 \quad \checkmark$$

$$n-1 = \sqrt{g-1} \Rightarrow n = \sqrt{g+1} + 1$$

$$R_f = \mathbb{R}$$

$$\Rightarrow g = \frac{1}{n^2 - 2n} \Rightarrow n^2 - 2n = \frac{1}{g}$$

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

$$n-1 = \sqrt{\frac{1+g}{g}}$$

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

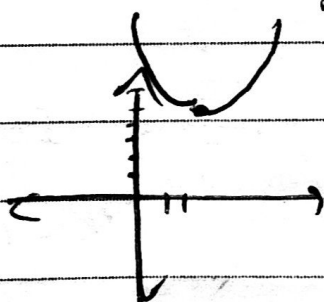
$$\Downarrow$$

$$n = \sqrt{\frac{1+g}{g}} + 1$$

$$g \neq 0, \quad \frac{1+g}{g} \geq 0 \Rightarrow \frac{-1}{+1 - \frac{1}{g}} \geq 0$$

$$R_f = \mathbb{R} - \{0\}$$

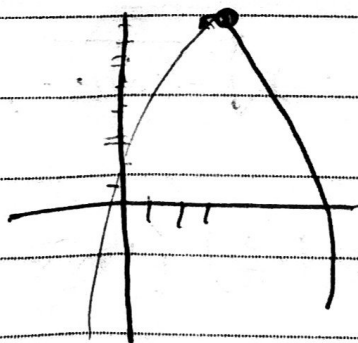
$$a) \quad \frac{-b}{2a} = 1$$



$$R_f = [1, +\infty)$$

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

$$g = 1$$



$$R_f = (-\infty, 1]$$

$$\sqrt{-V, +\infty}$$

$$c) \frac{b}{va} = v$$

$$g = -V$$

$$R_f = \sqrt{[0, +\infty)}$$

$$d) \frac{-b}{va} = v$$

$$g = 9$$

$$R_f = \sqrt{-\infty, 9] = [0, 9]}$$

$$e) R_f = \mathbb{R}$$

$$\Rightarrow R_f = \mathbb{R}$$

$$-9$$

$$f) R_f = \sqrt{\mathbb{R}} \Rightarrow [0, +\infty) \quad g) (\mathbb{R})^p = [0, +\infty)$$

$$h) R_f = \mathbb{R} - \{v\}$$

$$-1.$$

$$i) R_f = \mathbb{R} - \{v\}$$