

Handwritten notes at the bottom of the page, including the word "فرض" (Assume) and some illegible scribbles.

①
$$I) f(x) = x^r + x + 1 + 9x^r - 9x + 1$$

$$+ mx^r + nx + m = (1+m)x^r + (n-k)x + m + r$$

$$II) g(x) = (x^r - 1)(x^r + 1)(x^r - 1)(x^r + 1) = (x^{2r} - 1)(x^{2r} - 1) = x^{4r} - 2x^{2r} + 1$$

$$\Rightarrow a = \dots \Rightarrow b = \dots \Rightarrow n = \dots$$

①
$$g = \frac{x^r - 1}{x - 1} \Rightarrow \frac{(x^r - 1)(x^{r+1} + \dots + 1)}{x - 1} \Rightarrow \dots$$

$$f(x) = \frac{x^r + 1}{x^r - 1} \Rightarrow f[-x] \neq 0 \Rightarrow f[-x] \neq f[x] \Rightarrow \dots$$

$$Df = IR \cdot (-r, -1]$$

②
$$f(x) = \frac{x(x^r - 1)}{x^r + 1} \Rightarrow \dots$$

$$\Rightarrow I \cap II = Df = [1, +\infty)$$

$$II) |x| - 1 > 0 \Rightarrow |x| > 1 \Rightarrow x > 1 \vee x < -1$$

$$\Rightarrow I \cap II = Df = [1, +\infty)$$

③
$$y = \frac{1}{|x-1|-1-k}$$

$$y = k$$

④
$$y = |x| - [x]$$

$$y = |x| - [x]$$

4

$$f(a) = \frac{a^2 - r_a + r}{a + a} + b \xrightarrow{a=0} \frac{r}{a} + b = \frac{r + ab}{b} \Rightarrow r + ab = 0 \Rightarrow r + ab = -r$$

$$a=1 \rightarrow \frac{1 - r + r}{1 + a} + b = 0 + b = 1 \Rightarrow b = 1 \quad a - b = -r - 1 = -1 \Rightarrow \{-1\}$$

5

$$f(a) = g(a) \xrightarrow{a=0} \frac{-r}{-1} = 0 + c \Rightarrow c = r \quad (2) \quad x=1 \Rightarrow \frac{a+r}{b+1} = r \Rightarrow r_b + r = a + r$$

$$(3) \quad x=1 \Rightarrow \frac{r-a}{b-1} = 1 \Rightarrow r-a = b-1 \Rightarrow a = r-b \quad (1) \quad (1) \Rightarrow r_b + 1 = r - b \Rightarrow b = \frac{r}{2}$$

$$a = r - \frac{r}{2} \Rightarrow a = \frac{r}{2} \quad b + c = \frac{r}{2} + r = r, a$$

6

$$y = \sqrt{f_a - r_a} + k - 1 \Rightarrow f_a > r_a, y = \sqrt{b - f_a} + r_k \Rightarrow f_a < b$$

$$\Rightarrow D_f - y = \{1\} \Rightarrow b = 1 \Rightarrow r_a = r \Rightarrow a = \frac{r}{2}$$

$$f(a) = \sqrt{f_a - r} + k - 1, g(a) = \sqrt{f_a - f_a} + r_k \Rightarrow (f - g) = r_k - r - r_k = -k - r = r$$

$$\Rightarrow r_a - \frac{b}{2} - k = 1 - r + 1 = r$$

7

$$f(a) = \sqrt{m - a} + n, g(a) = \sqrt{r_a + r} \quad (1) \quad D_g \Rightarrow r_a + r > 0 \Rightarrow a > -1$$

$$(2) \quad D_f \Rightarrow m - a > 0 \Rightarrow m > a \Rightarrow m = v \quad D_g \cap D_f = [-1, v]$$

$$(3) \quad f - g(r) = f(r) - g(r) = 4\sqrt{r} \Rightarrow f(r) = 4\sqrt{r} \Rightarrow \sqrt{r} = \frac{4}{4} + n = \sqrt{r} - r$$

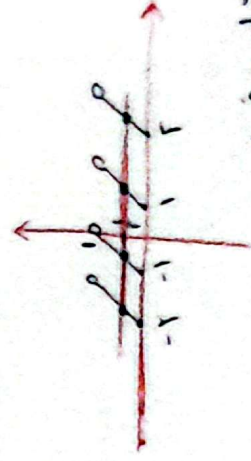
$$m + n = v + 4\sqrt{r} - r = 4\sqrt{r}, a$$

8

$$y = (-1)^r (a - [a]) = \frac{1}{2} \Rightarrow y = a - [a] = \frac{1}{2}$$

میانگین

$$[-1, 2] \text{ و } 1.2$$



میانگین برقرار