

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره .. (د) .. کلاس .. (ب) ..

$$\omega(fx) = \sqrt{\frac{x-1}{x} - \frac{2}{x-1}} = \sqrt{\frac{x^2 - 1 - 2x}{x^2 - x}} \Rightarrow \sqrt{\frac{1-2x}{x(x-1)}} = \frac{1}{\sqrt{x-1} + \sqrt{x}} \quad \text{Op. } (-\infty, 0) \cup \left(\frac{1}{4}, 1\right)$$

$$b) f(x) = \frac{1}{x+1} - \frac{r}{x} \Rightarrow \frac{x - r(x+1)}{(x+1)x} = \frac{x - rx - r}{(x+1)x} = \frac{-rx - r}{(x+1)x} = \frac{-r(x+1)}{(x+1)x} = \frac{-r}{x} \Rightarrow R = (-r, -1, -\frac{0}{r}, 0, 1)$$

① $\hookrightarrow x \neq 0, 1, -1, -2$

$$\text{c) } f(x) = \sqrt{\left(\left(\frac{1}{x}\right)^x - 9\right)(xx - x^x)} \Rightarrow \left(\left(\frac{1}{x}\right)^x - 9\right)(xx - x^x) \geq 0$$

$$D_f = (-\infty, -r] \cup [r, 0) \cup (r, 0) \cup (r, 0)$$

$\hookrightarrow \sqrt{x-1} + \sqrt{y+1} = y$

$\hookrightarrow \begin{cases} x-1 > 0 \\ x > 1 \end{cases}$

$\textcircled{1} \cap \textcircled{7} = [1, \infty)$

$\sqrt{y+1} = y - \sqrt{x-1}$

$y - \sqrt{x-1} > 0 \xrightarrow{\textcircled{8}} \textcircled{9} \quad | + \sqrt{x-1} \mid \rightarrow \textcircled{9} \Rightarrow y > \sqrt{x-1}$

$$F(x) = \frac{\int_0^x (x^r - x - r)}{\sqrt{x^r - 1} + 1} \rightarrow \begin{array}{l} x^r - x - r > 0 \\ (x-r)(x+1) > 0 \end{array} \quad \frac{-1}{r-1} \quad \frac{r}{r-1} \quad \left\{ \begin{array}{l} \text{if } r = (-\infty, -1) \cup \\ (r, +\infty) \end{array} \right.$$

$$f(x) = \sqrt{r+ax-xr} \Rightarrow \begin{array}{c} -r \quad b \\ - \quad + \quad - \end{array}$$

$$\xrightarrow{x=-r} r-ra-f=0$$

$$ra=-1$$

$$a=-\frac{1}{r}$$

$$\Rightarrow \sqrt{r+\frac{-1}{r}x-xr} \Rightarrow \frac{-x^r - \frac{1}{r}x + r}{+x^r + rx} \cdot \frac{(x+r)}{-x+\frac{r}{r}}$$

$$\frac{\frac{r}{r}x + r}{\frac{r}{r}x + r}$$

$$f(x) \Rightarrow \sqrt{(x+r)(-x+\frac{r}{r})} \Rightarrow b = \frac{r}{r}$$

$$\Rightarrow a+b = -\frac{1}{r} + \frac{r}{r} = \boxed{1}$$

$$f(x) = \begin{cases} x^2 - 1 & x \geq 1 \\ 1 - x^2 & x < 1 \end{cases}$$

$$g(x) = \sqrt{f(x) - x} \quad \begin{array}{l} x > 1 \quad \sqrt{x^2 - x - x} = \sqrt{x(x-1)} \rightarrow x > 1 \rightarrow x > 1 \\ x < 1 \quad \sqrt{x + x} \Rightarrow x + x > 0 \rightarrow x > -x \rightarrow -x \leq x < 1 \end{array}$$

$$f(x) = rx^r - f x$$

$$f\left(\sin \frac{\pi}{r}, \cos r\pi\right) \rightarrow \frac{\sqrt{r}}{r} + 1 = \frac{r + \sqrt{r}}{r}$$

$$\rightarrow \left(\frac{r + r + r\sqrt{r}}{r^2}\right) \times = r - r\sqrt{r} \Rightarrow \frac{r + r\sqrt{r} - r - r\sqrt{r}}{r} = \boxed{\frac{-1}{r}}$$

8

$$f(x) = \frac{x+1}{x-1}$$

$$f(a) = \frac{a+1}{a-1} \rightarrow f(f(a)) = \frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = \frac{\frac{a+1+a-1}{a-1}}{\frac{a+1-a+1}{a-1}} \Rightarrow \frac{2a}{2} = a$$

$a \in \mathbb{R} - \{1\}$ $\leftarrow$ $\because$ $\frac{a+1}{a-1} = 1 \Rightarrow a+1 = a-1 \Rightarrow 1 = -1$ $\therefore$ $a \neq 1$ $\square$

9

$$f(x) = x^r - f x$$

$$g(x) = \sqrt{x^r - 1}$$

$$f(g(a)) = -f \rightarrow f(\sqrt{a^r - 1}) \Rightarrow a^r - 1 - f\sqrt{a^r - 1} + f = 0$$

$$\Leftrightarrow (\sqrt{a^r - 1} - r)^2 = 0$$

$$a^r - 1 = f \rightarrow \frac{a^r - 1}{a} = \pm \sqrt{0}$$

10

$$f(x+r) = x^r - 0x + r$$

$$(x+r)^r \rightarrow x^r + rx^{r-1} + \dots + r = x^r - 0x + r \rightarrow (x+r)^r = (x+r)$$

$$\rightarrow f(1) \rightarrow 1^r - f = 1^r \quad \left\{ \begin{array}{l} 1^r \times 1^r = 1^r \end{array} \right.$$

$$f(-1) \rightarrow 9 - (-r) = 1^r$$

11

$$f(r \cos^r x + 0 \cos x) = \tan^r x$$

$$f(r, 0) \rightarrow r \cos^r x + 0 \cos x = r, 0 \rightarrow \cos^r x + 0 \cos x = \frac{r}{r} = 1$$

$$(\cos x)^r (\cos x + 1) = 1 \quad \left\{ \begin{array}{l} \cos x = \frac{1}{r} = \frac{1}{r} \\ \cos x = -\frac{1}{r} \end{array} \right.$$

$$\rightarrow \tan^r x = \frac{1 - \cos^r x}{\cos^r x} \Rightarrow \frac{1 - \frac{1}{r}}{\frac{1}{r}} = \frac{r}{1} = \boxed{r}$$

$$-1 \leq \cos x \leq 1 \quad \cup = \cup \cup \dots$$

12