

نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره ... (کلاس) ...

$f(x) = \sqrt{\frac{x-1}{x} - \frac{x}{x-1}} \rightarrow \frac{x^2+1-2x-x^2}{x^2-x} = \frac{1-2x}{x(x-1)}$ $f(x) = \frac{\frac{1}{x-1} - \frac{x}{x}}{\frac{x}{x-1} + \frac{1}{x}}$	$\frac{x^2-2x-2}{x(x+1)} \rightarrow 0, -1$ $\frac{x^2-2x-2}{(x-1)(x+2)} \rightarrow 1, -2$	$D_f = (-\infty, 0) \cup \left(\frac{1}{x}, 1\right)$ $D_f = \mathbb{R} - \left\{0, -1, -\frac{2}{x}, 1, -2\right\}$	1
$f(x) = \sqrt{\left(\frac{1}{x}\right)^2 - 9} \left(\frac{1}{x} - \frac{9}{x}\right)$	$\left(\frac{1}{x}\right)^2 - 9 = 0 \Rightarrow x = -\frac{1}{3}$ $3x^2 - 4x > 0 \Rightarrow x > \frac{4}{3} \text{ or } x < 0$	$\frac{-2}{x} - \frac{9}{x} = \frac{-11}{x}$ $D_f = (-\infty, -\frac{11}{x}] \cup [\frac{11}{x}, +\infty)$	2
$f(x) = \frac{\log(x^2 - x - 2)}{\sqrt{x^2 - 1} + 1}$	$x^2 - x - 2 > 0 \Rightarrow x < -1 \text{ or } x > 2$ $x^2 - 1 > 0 \Rightarrow x < -1 \text{ or } x > 1$	$\frac{-1}{x} - \frac{2}{x} = \frac{-3}{x}$ $D_f = (-\infty, -1] \cup [2, +\infty)$	3
$f(x) = \sqrt{3 + 4x - x^2}$	$3 - 2x - x^2 = 0 \Rightarrow x = \frac{-1 \pm \sqrt{13}}{2}$ $3 - \frac{1}{x}x - x^2 = 0 \Rightarrow x = \frac{1}{x}$ $\frac{-2}{x} + \frac{2}{x} = 0 \Rightarrow b = \frac{1}{x}$	$a + b = \frac{1}{x} + \frac{1}{x} = \frac{2}{x}$	4
$g(x) = \begin{cases} \sqrt{x-2} & x \geq 2 \\ \sqrt{x+3} & x < 2 \end{cases}$	$2x - 4 \geq 0 \Rightarrow x \geq 2$ $x + 3 \geq 0 \Rightarrow x \geq -3 \quad -3 \leq x < 2$	$D_f = [-3, +\infty)$	5

$$\frac{\sqrt{r}}{r} + 1 = \frac{r + \sqrt{r}}{r}$$

$$r \left(\frac{r + \sqrt{r}}{r} \right)^r - r \frac{r + \sqrt{r}}{r} = \frac{r + r + r\sqrt{r}}{r} - \frac{r + \sqrt{r}}{r} = \frac{-1}{r}$$

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$$f(f(a)) = a$$

$$f\left(\frac{a+1}{a-1}\right) = \frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = \frac{\frac{a+1+a-1}{a-1}}{\frac{a+1-a+1}{a-1}} = \frac{2a}{2} = a$$

$D_f = \mathbb{R} - \{1\}$

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$$P(n) = -\epsilon \Rightarrow q_n^r - \epsilon q_n + \epsilon = 0 \Rightarrow q_n = r$$

$$g(a) = r \Rightarrow \sqrt{a^r - 1} = r \Rightarrow a^r - 1 = r^2 \Rightarrow a^r = r^2 + 1 \Rightarrow a = \pm \sqrt[r]{r^2 + 1}$$

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$$f(n+r) = n^r - r n + r$$

$$f(r) = 1 - r + r = 1$$

$$f(-r) = r^r + r^0 + r = r^r + 1 + r$$

$$\left. \begin{array}{l} f(r) = 1 \\ f(-r) = r^r + 1 + r \end{array} \right\} r^r = 1 \Rightarrow r = 1$$

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$$\epsilon \cos \theta + \delta \cos \theta = \frac{v}{r} \Rightarrow \epsilon \cos \theta + \delta \cos \theta - \frac{v}{r} = 0$$

$$\hookrightarrow \cos \theta + \delta \cos \theta - 1 \epsilon = 0 \quad \begin{array}{l} \nearrow \cos \theta = \frac{v}{r} \quad \nabla \Rightarrow \theta = \frac{\pi}{r} \\ \searrow \cos \theta = \frac{-v}{r} \quad \times \end{array}$$

$$f\left(\frac{v}{r}\right) = \tan\left(\frac{\pi}{r}\right) = v$$

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