

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

الف) $\frac{x-1}{x} - \frac{x}{x-1} \geq 0 \Rightarrow \frac{(x-1)^2 - x^2}{x(x-1)} \geq 0 \Rightarrow \frac{x^2 - 2x + 1 - x^2}{x^2 - x} \geq 0 \Rightarrow \frac{-2x + 1}{x^2 - x} \geq 0$

ب) $\frac{\frac{1}{x+1} - \frac{2}{x}}{\frac{2}{x-1} + \frac{1}{x+2}} = \frac{\frac{-x-2}{x(x+1)}}{\frac{2x+5}{(x-1)(x+2)}} = \frac{(-x-2)(x-1)(x+2)}{x(x+1)(2x+5)}$
 $D_f = (-\infty, 0) \cup [\frac{1}{2}, 1)$
 $D_f = \mathbb{R} - \{0, -1, -\frac{5}{2}, 1, -2\}$

الف) $((\frac{1}{x})^x - 9)(x^2 - 5x) \geq 0$
 $D_f = [-2, \frac{5}{2}]$

ب) $x-1 \geq 0 \Rightarrow x \geq 1$
 $y+1 \geq 0 \Rightarrow y \geq -1$
 $\sqrt{y+1} = \sqrt{x-1} \Rightarrow x-1 \geq 0 \Rightarrow x \geq 1$
 $\Rightarrow D_f = [1, 1]$

$\log_f \frac{x^2 - x - 2}{\sqrt{x^2 - 1} + 1}$
 $x^2 - x - 2 > 0 \Rightarrow (x+1)(x-2) > 0$
 $D_f = (-\infty, -1) \cup (2, +\infty)$

$x^2 - 1 \geq 0 \Rightarrow x^2 \geq 1 \Rightarrow x \geq 1$
 $x \leq -1$
 $D_f = (-\infty, -1) \cup (2, +\infty)$

$-x^2 + ax + 3 \geq 0$
 $-(-2)^2 + a(-2) + 3 = 0 \Rightarrow -4 - 2a + 3 = 0 \Rightarrow -2a = 1 \Rightarrow a = -\frac{1}{2}$
 $-x^2 - \frac{1}{2}x + 3 \geq 0$
 $\Delta = (-\frac{1}{2})^2 - 4(-1)(3) = \frac{1}{4} + 12 = \frac{49}{4}$
 $x = \frac{+\frac{1}{2} \pm \sqrt{\frac{49}{4}}}{-2} \Rightarrow x_1 = \frac{\frac{1}{2} + \frac{7}{2}}{-2} = \frac{4}{-2} = -2$
 $x_2 = \frac{\frac{1}{2} - \frac{7}{2}}{-2} = \frac{-3}{-2} = \frac{3}{2}$
 $D_f = [-2, \frac{3}{2}]$
 $-2 \times b = -3 \Rightarrow b = \frac{3}{2}$
 $a+b = -\frac{1}{2} + \frac{3}{2} = 1$

$f(x) = \begin{cases} 3x-2 & x \geq 1 \\ 2x+3 & x < 1 \end{cases}$

$g(x) = \sqrt{f(x) - x}$
 $f(x) - x \geq 0 \Rightarrow f(x) \geq x$
 $D_f = [-3, +\infty)$
 $\begin{cases} 3x-2 \geq x \xrightarrow{x \geq 1} 2(x-1) \geq 0 \Rightarrow x \geq 1 \\ 2x+3 \geq x \xrightarrow{x < 1} x+3 \geq 0 \Rightarrow x \geq -3 \end{cases}$

$-3 \leq x < 1$

$$\sin \frac{\pi}{p} + \cos r\pi = \frac{\sqrt{r}}{r} + (+1) = \frac{\sqrt{r}+r}{r}$$

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

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

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

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

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$$g(a) = \sqrt{a^2-1} = t$$

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

$$t^r - r t + r = 0$$

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

$$a^2-1=r$$

$$a^2 = r+1 \quad a = \pm\sqrt{r+1}$$

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$$f(x+y) = x^r - \omega x + y$$

$$x+y=r \Rightarrow x=1 \Rightarrow f(r) = 1 - \omega + r = r$$

$$x+y=-r \Rightarrow x=-r \Rightarrow f(-r) = (-r)^r - \omega(-r) + r = r^r + r\omega + r = r^r$$

$$f(r) \times f(-r) = r \times r^r = r^{r+1}$$

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$$r \cos^r x + \omega \cos x = \frac{r}{p}$$

$$r \cos^r x + \omega \cos x - \frac{r}{p} = 0$$

$$\Delta = (a)^r - f(r)\left(-\frac{r}{p}\right) = 11$$

$$x = \frac{-\omega \pm 9}{1}$$

$$\cos x_1 = \frac{-r}{\lambda} \times -1 < \cos x \leq 1$$

$$\cos x_2 = \frac{1}{p} \rightarrow x > 90^\circ$$

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$$f\left(\frac{r}{p}\right) = \frac{\frac{r}{p}}{\frac{1}{p}} = r$$

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