

$x \neq 0$ $x+1 \neq 0$ $x \neq -1$ $x+2 \neq 0$ $x \neq -2$ $\frac{x}{x-1} + \frac{1}{x+2} = \frac{x(x+2)}{x^2+2x-2} \neq 0 \quad x^2+2x-2 \neq 0$ $x \neq \frac{-2 \pm \sqrt{4+8}}{2} = \frac{-2 \pm \sqrt{12}}{2} = -1 \pm \sqrt{3}$ $D_f = \mathbb{R} - \left\{ -1 \pm \sqrt{3}, -\frac{2}{x} \right\}$	$\frac{x-1}{x} - \frac{x}{x-1} \geq 0$ $(x-1)^2 - x^2 \geq 0 \rightarrow (x-1)^2 - x^2 \geq 0$ $x(x-1) \leq 0$ $x \leq \frac{1}{x}$ $x=1 \quad x=0$ $D_f = (-\infty, 0) \cup \left[\frac{1}{x}, 1 \right]$
$\left(\left(\frac{1}{x} \right)^x - 9 \right)$ $\left(\frac{1}{x} \right)^x - 9 = 0$ $x^{-1/x} = 9^x$ $-x = 2$ $x = -2$ $x^2 - x^2 = 0$ $x^2 = x^2$ $0 = 2x$ $x = \frac{0}{2} = 0$ $D_f = (-\infty, -2] \cup [0, +\infty)$	$(\sqrt{y-1})^2 = (x - \sqrt{x-1})^2$ $y-1 = x + \sqrt{x-1} - 2\sqrt{x-1}$ $y = 1 + \sqrt{x-1} - 2\sqrt{x-1}$ $x-1 \geq 0$ $x \geq 1$ $D_f = [1, +\infty)$
$x^2 - x - 2 > 0$ $(x+1)(x-2) > 0$ $x = -1 \quad x = 2$ $D = (-\infty, -1) \cup (2, +\infty)$	$x^2 - 1 > 0$ $(x-1)(x+1) > 0$ $x = 1 \quad x = -1$ $D = (-\infty, -1) \cup (1, +\infty)$ $I \cap II = (-\infty, -1) \cup (2, +\infty)$
$-x^2 + ax + 2 > 0$ $-x^2 - \frac{1}{x}x + 2 = 0$ $-x^2 = x + 4 = 0$ $x^2 - x - 4 = 0 \rightarrow (x+2)(x-2) = 0$ $x = -2 \quad x = 2$ $a+b = -\frac{1}{x} + \frac{x}{x} = 1$	$a+b = -\frac{1}{x} + \frac{x}{x} = 1$
$f(x) - x \geq 0$ $f(x) \geq x \rightarrow x^2 - 2 \geq x$ $x^2 \geq x + 2$ $x \geq 1 \quad \cap \quad x \geq 1 \rightarrow [1, +\infty)$ $I \cup II \rightarrow [-2, +\infty) = D_f$	$x^2 + 2 \geq x$ $x \geq -2 \quad \cap \quad x < 1 \rightarrow [-2, 1)$

$$f\left(\sin \frac{\pi}{4} + \cos \frac{\pi}{4}\right)$$

$$f(\sin 40^\circ + \cos 40^\circ)$$

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

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

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

$$a-1 \neq 0$$

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

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

$$a-1 \neq 0$$

$$a \neq 1$$

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

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

$$f(g(a)) = ?$$

$$x = g(a)$$

$$g(a) = t$$

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

$$f(g(a)) = g(a)^r - \epsilon g(a) = -\epsilon$$

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

$$\sqrt{x^r - 1} = r$$

$$(t-r)^r = 0 \rightarrow t=r$$

$$x^r - 1 = \epsilon$$

$$x^r = 1 + \epsilon$$

$$x = \pm \sqrt[r]{1+\epsilon}$$

$$a+r = -r$$

$$a = -4$$

$$a+r = r$$

$$a = 1$$

$$f(-r) = r^4 + r^0 + 4 = 17$$

$$f(e) = 1 - 2 + 4 = 3$$

$$f(-r) \times f(e) = 17 \times 3 = \boxed{51}$$

$$f(r \cos^r \alpha + a \cos^r \alpha) = \tan^r \alpha$$

$$f(r/a) = ?$$

$$\cos \alpha = t$$

$$rt^r + at = \frac{v}{r}$$

$$f(r/a) = (\tan 40^\circ)^r = (\sqrt{r})^r = \boxed{r}$$

$$rt^r + at = \frac{v}{r} = 0$$

$$17t^r + 10t = v = 0$$

$$A = 100 - \frac{f(A)(v)}{(-f)(-v)} = 100 + rre = rre$$

$$\sqrt{rre} = 17$$

$$\alpha_1 = \frac{-17 - 10}{19} = -\frac{v}{r} \quad -1 \leq \cos \alpha \leq 1$$

$$\alpha_2 = \frac{17 - 10}{19} = \frac{1}{r} \quad \left| \cos \alpha = \frac{1}{r} \right| \quad \alpha = 90^\circ$$