

211) $\frac{x+3}{(x-1)(4x^2-14x+10)} \Rightarrow (x-1)(4x^2-14x+10) \neq 0$ 2-1

$\Rightarrow x \neq 1, \frac{x^2-14x+10}{(x-1)(x-4)}$

$\Rightarrow D_f = R - \{1, 2, 1, 1\}$

212) $\frac{x+3}{(x+1)(3x^2-5x-4)} \Rightarrow (x+1)(3x^2-5x-4) \neq 0$

$\Rightarrow x \neq -1, \frac{x^2-5x-12}{(x-4)(x+2)}$

$\Rightarrow D_f = R - \{-1, 2, -\frac{1}{3}\}$

الف) $3-2x \geq 0 \Rightarrow 3 \geq 2x \Rightarrow 1,5 \geq x$

$x - \sqrt{3-2x} \neq 0 \Rightarrow x \neq \sqrt{3-2x} \Rightarrow x^2 \neq 3-2x$

$\Rightarrow x^2+2x-3 \neq 0 \Rightarrow x \neq 1, x \neq -3$

$\Rightarrow D_f = (-\infty, 1,5] - \{1, -3\}$ ناقص $x = -3 \rightarrow y = \frac{-4}{-9}$

ب) $3x-2 \geq 0 \Rightarrow 3x \geq 2 \Rightarrow x \geq \frac{2}{3}$

$x - \sqrt{3x-2} \neq 0 \Rightarrow x \neq \sqrt{3x-2} \Rightarrow x^2 \neq 3x-2$

$\Rightarrow x^2-3x+2 \neq 0 \Rightarrow x \neq 1, x \neq 2$

$\Rightarrow D_f = [\frac{2}{3}, \infty) - \{1, 2\}$

ج) $2\cos x - 1 \neq 0 \Rightarrow 2\cos x \neq 1 \Rightarrow \cos x \neq \frac{1}{2}$

$\Rightarrow x \neq 2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3} \Rightarrow D_f = R - \{2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3}\}$

$$1) r \sin x + 1 \neq 0 \Rightarrow r \sin x \neq -1 \Rightarrow \sin x \neq -1/d$$

$$\Rightarrow x \neq k\pi + \frac{\sqrt{d}}{4} \text{ و } k\pi + \frac{11\pi}{4} \Rightarrow D_f = \mathbb{R} - \left\{ k\pi + \frac{\sqrt{d}}{4}, k\pi + \frac{11\pi}{4} \right\}$$

$$2) \cos x - 1 \neq 0 \Rightarrow \cos x \neq 1 \Rightarrow x \neq k\pi + \frac{\pi}{k}$$

$$\sin x \neq 0 \Rightarrow x \neq k\pi \text{ و } \cos x \neq 0 \Rightarrow x \neq k\pi + \frac{\pi}{2}$$

$$\Rightarrow D_f = \mathbb{R} - \left\{ k\pi, k\pi + \frac{\pi}{k}, k\pi + \frac{\pi}{2} \right\} \Rightarrow D_f = \mathbb{R} - \left\{ k\frac{\pi}{k}, k\pi + \frac{\pi}{k} \right\}$$

$$3) r \sin^2 x - r \neq 0 \Rightarrow r \sin^2 x \neq r \Rightarrow \sin^2 x \neq \frac{r}{k} \Rightarrow \sin x \neq \pm \frac{\sqrt{r}}{k}$$

$$\Rightarrow x \neq k\pi + \frac{\pi}{k} \text{ و } k\pi + \frac{r\pi}{k} \Rightarrow D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{k}, k\pi + \frac{r\pi}{k} \right\}$$

$$4) (x-2)(x-3) \rightarrow \frac{-\infty}{+} \frac{2}{0} \frac{3}{-} \frac{+\infty}{+} \Rightarrow D_f = (-\infty, 2) \cup (3, +\infty)$$

$$5) 1, d \rightarrow \frac{-\infty}{+} \frac{1}{0} \frac{d}{-} \frac{+\infty}{+} \Rightarrow D_f = (1, d)$$

$$6) -1, -d \rightarrow \frac{-\infty}{+} \frac{-d}{0} \frac{-1}{-} \frac{+\infty}{+} \Rightarrow D_f = (-\infty, -d] \cup [-1, \infty)$$

$$7) 1, 4 \rightarrow \frac{-\infty}{+} \frac{1}{0} \frac{4}{-} \frac{+\infty}{+} \Rightarrow D_f = [1, 4]$$

$$8) d, 1, 2 \rightarrow \frac{-\infty}{-} \frac{1}{0} \frac{2}{+} \frac{d}{-} \frac{+\infty}{+} \Rightarrow D_f = (-\infty, 1) \cup (2, d)$$

$$\Rightarrow D_f = (-\infty, 1) \cup (2, d)$$

$$9) \pm 1, 1, d \rightarrow \frac{-\infty}{+} \frac{-1}{0} \frac{1}{-} \frac{d}{-} \frac{+\infty}{+} \Rightarrow D_f = (-\infty, -1] \cup (d, \infty)$$

$$\Rightarrow D_f = (-\infty, -1] \cup (d, \infty)$$

$$1) \frac{x^2 - 5x + 4}{x^2 - 1} \geq 0 \Rightarrow \frac{x^2 - 5x + 4}{(x-1)(x+1)} \geq 0$$

1, 2

$$\Rightarrow D_f = [1, +\infty)$$

$$2) x^2 - 1 \neq 0 \Rightarrow x \neq \pm 1 \Rightarrow D_f = \mathbb{R} - \{\pm 1\}$$

+ 0 - 1 + $\rightarrow (-\infty, 0) \cup (1, +\infty)$

$$3) x^2 - 5x > 0 \Rightarrow x \neq 0, 5 \Rightarrow D_f = \mathbb{R} - \{0, 5\}$$

$$4) |4 - x^2| > 0 \Rightarrow \frac{-\infty \quad -2 \quad 2 \quad +\infty}{\quad \quad 0 \quad \quad 0 \quad \quad} \rightarrow x \in (-2, 2)$$

$$|x| - 2 > 0 \Rightarrow |x| > 2 \Rightarrow x > 2 \cup x < -2 \Rightarrow x \in (-\infty, -2) \cup (2, +\infty)$$

$$|x| - 2 \neq 1 \Rightarrow |x| \neq 3 \Rightarrow x \neq \pm 3$$

$$\rightarrow D_f = (-4, -2) \cup (2, 4) - \{\pm 3\}$$

$$5) \frac{x^2 - 6x + 9}{x - 3} > 0 \Rightarrow \frac{-\infty \quad 3 \quad +\infty}{\quad \quad 0 \quad \quad} \rightarrow x \in (3, +\infty)$$

$$10 - x > 0 \Rightarrow 10 > x$$

$$10 - x \neq 1 \Rightarrow -x \neq -9 \Rightarrow x \neq 9$$

$$\Rightarrow D_f = (9, 10) - \{9\}$$

$$6) x^2 - 11x + 28 \geq 0 \Rightarrow \frac{-\infty \quad 4 \quad 7 \quad +\infty}{\quad \quad 0 \quad \quad} \rightarrow x \in (-\infty, 4] \cup [7, +\infty)$$

$$\sqrt{4 - x^2} > 0 \Rightarrow 4 - x^2 > 0 \Rightarrow 4 > x^2 \Rightarrow 2 > x > -2$$

$$x > 0, x \neq 1 \Rightarrow$$

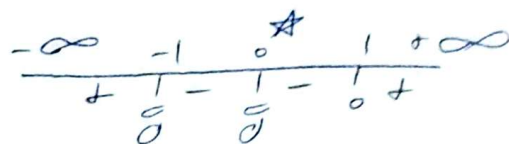
$$\Rightarrow D_f = (0, 4] - \{1\}$$

$$y = \frac{x^2 - x}{x^2 + x}$$

$\xrightarrow{\text{Erweiterung}} 0, 1$
 $\xrightarrow{\text{Erweiterung}} 0, -1$

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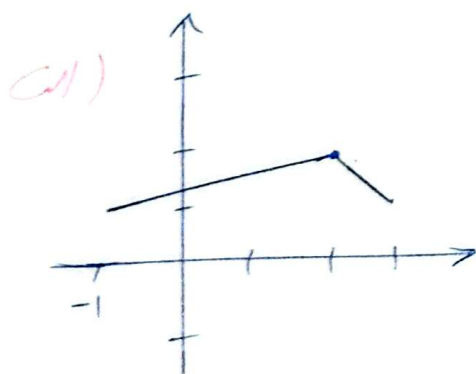
	-1	0	1	
$x^2 - x$	+	+	-	+
$x^2 + x$	+	-	+	+
$f(x)$	+	-	-	+



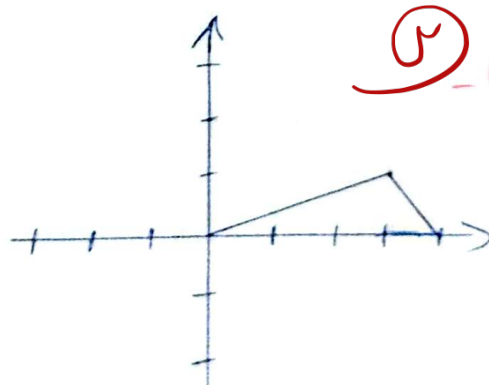
$$\frac{x - f(x)}{f(x)} \geq 0 \Rightarrow \frac{-\infty \quad -1 \quad 1 \quad +\infty}{- \quad \underbrace{0+0} \quad - \quad \underbrace{0+0} \quad -} \Rightarrow P_f = [-1, 1] \cup [1, 2]$$

$\xrightarrow{\text{Erweiterung}} -1, 2$
 $\xrightarrow{\text{Erweiterung}} -2, 2$

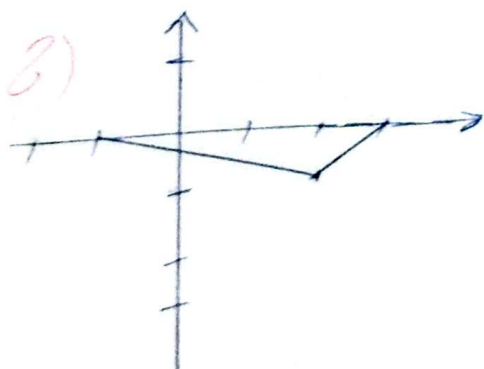
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b)



10



d)

