7/6

$$\sin(mx)\cdot\cos(nx) = \frac{1}{2}\cdot(\sin\alpha + \sin\beta)$$

$$mx = \frac{\alpha+\beta}{2} \quad ; \quad nx = \frac{\alpha-\beta}{2}$$

~~$\beta = 2mx - \alpha$~~ $\quad\Big|\quad nx = \frac{\alpha-(2mx-\alpha)}{2}$

$2mx = \alpha + \beta$

$2mx - \alpha = \beta$

$2nx = \alpha - 2mx + \alpha$

$2nx = 2\alpha - 2mx$

$2nx + 2mx = 2\alpha$

$2x\cdot(n+m) = 2\alpha$

$x\cdot(n+m) = \alpha$

$2nx = \alpha - \beta$

$2nx + \beta = \alpha$

$\Big|\quad mx = \frac{(2nx+\beta)+\beta}{2}$

$2mx = 2nx + 2\beta$

$2mx - 2nx = 2\beta$

$2x(m-n) = 2\beta$

$x(m-n) = \beta$

$$\sin(mx)\cdot\cos(nx) = \frac{1}{2}\cdot\left(\sin((m+n)x) + \sin((m-n)x)\right)$$

17 - d

$\log_{10}(x+2) - \log_{10}(x-1) = 2 - \log_{10} 4$

podm. $x+2>0 \wedge x-1>0$

$x>-2 \wedge x>1$

$\log_{10}\left(\frac{x+2}{x-1}\right) = \log_{10}\left(\frac{100}{4}\right)$

$\frac{x+2}{x-1} = 25$

$x+2 = 25x-25$

$27 = 24x$

$x = \frac{27}{24}$

$x = \frac{9}{8}$

---

18 - b

$f(x) = \log(13+x-5x^2+(4x+5)\cdot|x-1|)$

$D(f) = ?$

$13+x-5x^2+(4x+5)\cdot|x-1| > 0$

$(4x+5)|x-1| > 4x^2 - x - 13$

pro $x \neq \frac{-5}{4}$

$|x-1| > (4x+5)\cdot(x^2-x-13)$

pro $x>1$

$x-1 > (4x+5)\cdot(x^2-x-13)$

$0 > (4x+5)\cdot(x^2-x-13) - x + 1$

$0 > 20x^3 + 21x^2 - 58x - 64$

$x_{1,2} = \frac{1 \pm \sqrt{1+260}}{10}$

$\frac{3\sqrt{24}}{10} \doteq 1{,}62$

$\frac{1-3\sqrt{24}}{10} \doteq (-1{,}52)$

7/8 - b

$$f(x) = \log(13 + x - 5x^2 + (9x+5)|x-1|)$$

$$13 + x - 5x^2 + (9x+5)|x-1| > 0$$

pro $x < 1$

$$13 + x - 5x^2 + (9x+5)\cdot(1-x) > 0$$

$$13 + x - 5x^2 + (-9x^2 - x + 5) > 0$$

$$-9x^2 > -18$$

$$x^2 < 2$$

$$|x| < \sqrt{2}$$

$D_1(f) = (-\sqrt{2}; 1)$

pro $x \geq 1$

$$13 + x - 5x^2 + (9x+5)\cdot(x-1) > 0$$

$$13 + x - 5x^2 + (9x^2 + x - 5) > 0$$

$$-x^2 + 2x + 8 > 0$$

$$x^2 - 2x - 8 < 0$$

$$(x-4)\cdot(x+2) < 0$$

	-2		4	
$(x-4)$	$-$	$-$		$+$
$(x+2)$	$-$		$+$	$+$
	$+$		$-$	$+$

$D_2(f) = \langle 1; 4)$

$D(f) = D_1(f) \cup D_2(f) = (-\sqrt{2}; 4)$