

2.65
3

(1) המספרים המותרים (x) הם אלה שבהם הפונקציה היא

$$-x^2 - 3x + a - 2 \neq 0$$

$$\Delta < 0 \quad 9 + 4(a - 2) < 0$$

$$4a < -1$$

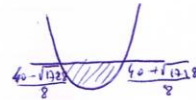
$$\boxed{a < -\frac{1}{4}}$$

$$f' = \frac{-2x(a-2-3x-x^2) + (2x+3)(3-x^2)}{(a-2-3x-x^2)^2} = \frac{-2xa+4x+6x^2+6x+9-2x^2-3x^2}{(\quad)^2}$$

$$= \frac{3x^2+10x-2xa+9}{(\quad)^2}$$

$$0 > \Delta = (10-2a)^2 - 12 \cdot 9 = 100 - 40a + 4a^2 - 108 = 4a^2 - 40a - 8$$

$$a = \frac{40 \pm \sqrt{1728}}{8}$$



כל המספרים בין אלה

$$\boxed{5 - \sqrt{27} < a < 5 + \sqrt{27}}$$

$$\frac{40 - \sqrt{1728}}{8} < a < \frac{40 + \sqrt{1728}}{8}$$

(2) $f = \frac{-x^2+3}{-x^2-3x+9}$

(1) $-x^2-3x+9 \neq 0 \rightarrow x \neq \frac{3 \pm \sqrt{45}}{-2} = \frac{3 \pm 3\sqrt{5}}{-2}$

(2) $\lim_{x \rightarrow \frac{3+\sqrt{5}}{-2}^+} \frac{-x^2+3}{-x^2-3x+9} = \frac{-}{+0} = -\infty$

$$\lim_{x \rightarrow \frac{3+\sqrt{5}}{-2}^-} \frac{-x^2+3}{-x^2-3x+9} = \frac{-}{-0} = \infty$$

$$\lim_{x \rightarrow \frac{3-3\sqrt{5}}{-2}^+} = \frac{-}{-0} = \infty$$

$$\lim_{x \rightarrow \frac{3-3\sqrt{5}}{-2}^-} = \frac{-}{+0} = -\infty$$

$$m = \lim_{x \rightarrow \infty} \frac{-x^2+3}{x(-x^2-3x+9)} = 0$$

$$n = \lim_{x \rightarrow \infty} \frac{-x^2+3}{-x^2-3x+9} = 1 \rightarrow \boxed{y=1}$$

(3-4) $f' = \frac{3x^2+12x+9}{(-x^2-3x+9)^2} \rightarrow$

-10	-3+3√5	0	1	1 1/2	3-3√5	3	4
+	+	0	-	-	-	0	+
		↑	↓		↓	↑	

$$-\frac{3+3\sqrt{5}}{2} < x < 1, \quad x < \frac{3-3\sqrt{5}}{2} \text{ (אין)}$$

$$\frac{3-3\sqrt{5}}{2} < x < 3, \quad 1 < x < \frac{3-3\sqrt{5}}{2} \text{ (אין)}$$

$$\max(1, \frac{2}{3})$$

$$\min(3, \frac{2}{3})$$

