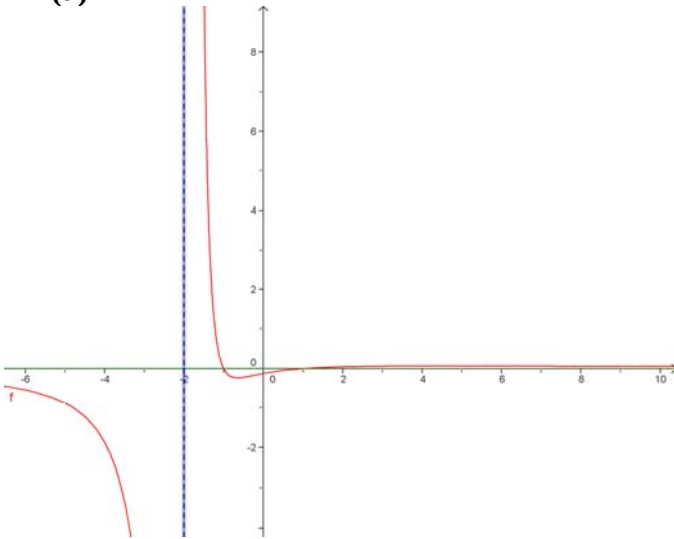


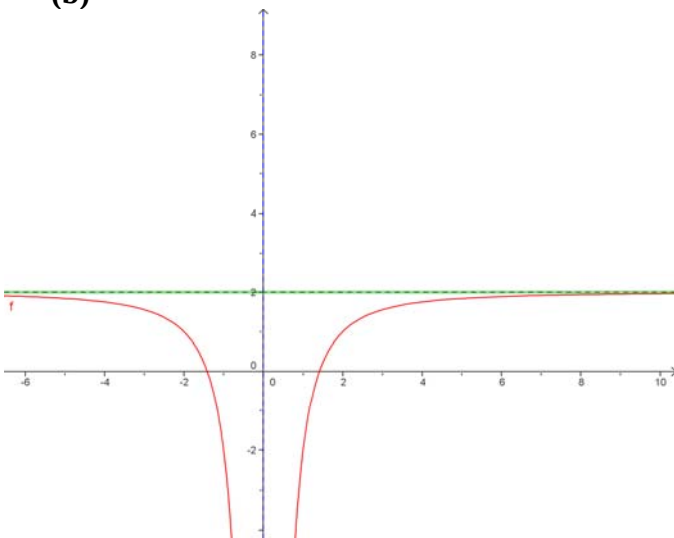
RACIONALNA FUNKCIJA IN STOŽNICE - rešitve

1. naloga

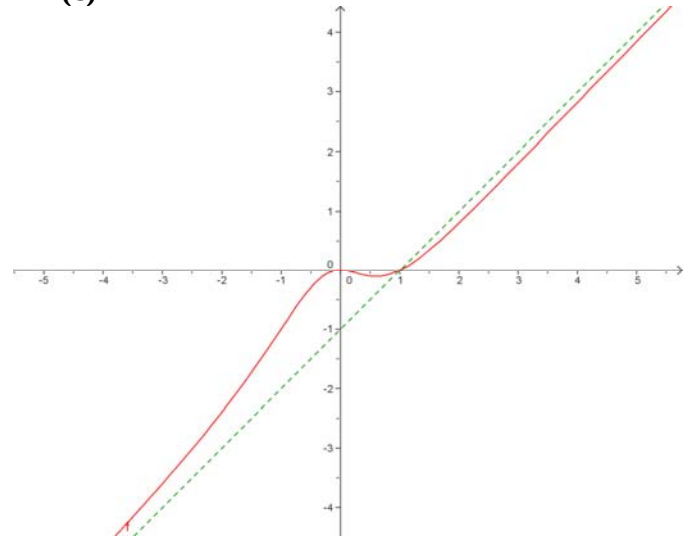
(a)



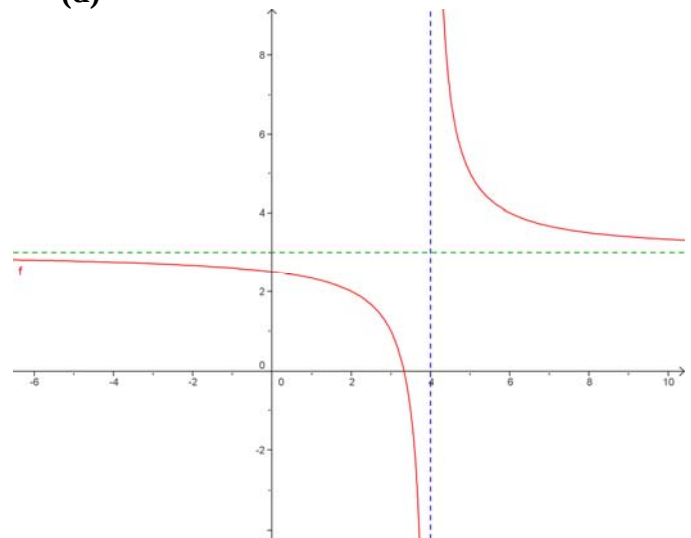
(b)



(c)



(d)



2. naloga

(a)

$$f(x) = 3 + x + \frac{x-2}{x+1} = \frac{x^2 + 5x + 1}{x+1} = \underline{\underline{x + 4 + \frac{-3}{x+1}}}$$

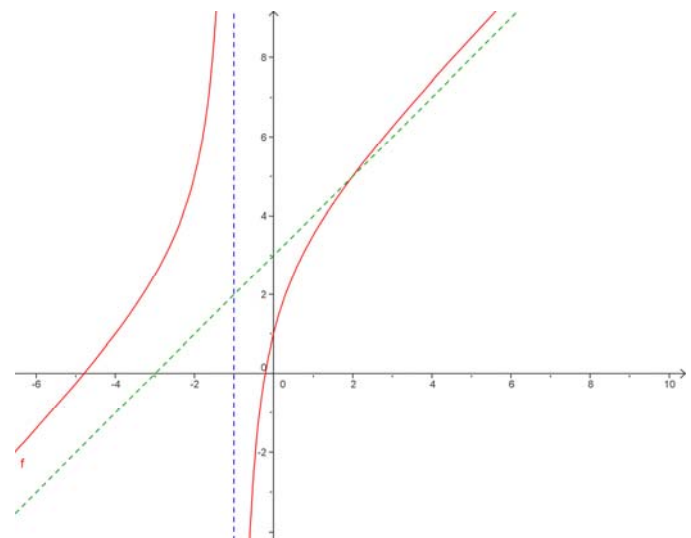
$$\text{Ničle: } x_{1,2} = \frac{-5 \pm \sqrt{21}}{2}$$

$$\text{Poli: } x = -1 \text{ (1. stopnje)}$$

$$\text{Asimptota: } y = x + 4$$

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

$$Z_f = \mathbb{R}$$



(b)

$$f(x) < 4 \Rightarrow \frac{x^2 + x - 3}{x + 1} < 0$$

$$\text{Ničle: } x_{1,2} = \frac{-1 \pm \sqrt{13}}{2}$$

$$\text{Poli: } x = -1$$

$$\text{Rešitev: } x \in \left(-\infty, \frac{-1 - \sqrt{13}}{2}\right) \cup \left(\frac{-1 + \sqrt{13}}{2}, \infty\right)$$

3. naloga

(a)

$$\frac{2x}{x+1} = \frac{x}{1-x} - \frac{1}{4-4x^2} \quad x \neq \pm 1$$

$$\frac{4(x-1)2x + 4x(x+1) - 1}{4(x+1)(x-1)} = 0$$

$$\frac{12x^2 - 4x - 1}{4(x+1)(x-1)} = 0$$

$$\Rightarrow 12x^2 - 4x - 1 = 0$$

$$\underline{\underline{x_1 = \frac{1}{2}}}$$

$$\underline{\underline{x_2 = -\frac{1}{6}}}$$

(b)

$$\frac{2x}{x-1} - \frac{7}{2} = \frac{x+1}{x-1} + \frac{5}{2-2x} \quad x \neq 1$$

$$\frac{4x - 7(x-1) - 2(x+1) + 5}{2(x-1)} = 0$$

$$\frac{-5x + 10}{2(x-1)} = 0$$

$$\Rightarrow -5x + 10 = 0$$

$$\underline{\underline{x = 2}}$$

4. naloga

(a)

$$\frac{x-1}{3x+1} \geq 1 \quad x \neq -\frac{1}{3}$$

$$\frac{x-1}{3x+1} - 1 \geq 0$$

$$\frac{-2x-2}{3x+1} \geq 0$$

$$\underline{\underline{-1 \leq x < -\frac{1}{3}}}$$

(b)

$$\frac{2}{x} + 1 \geq x \quad x \neq 0$$

$$\frac{-x^2 + x + 2}{x} \geq 0$$

$$\underline{\underline{x \in (-\infty, -1] \cup (0, 2]}}$$

5. naloga

$$S(4, -1), r_1 = 3;$$

$$\text{Namig: Veljati mora } r_2 > d(S, O). (x-4)^2 + (y+1)^2 = r_2^2, r_2 > \sqrt{17}$$

6. naloga

$$(x-6)^2 + (y-\sqrt{5})^2 = 9,$$

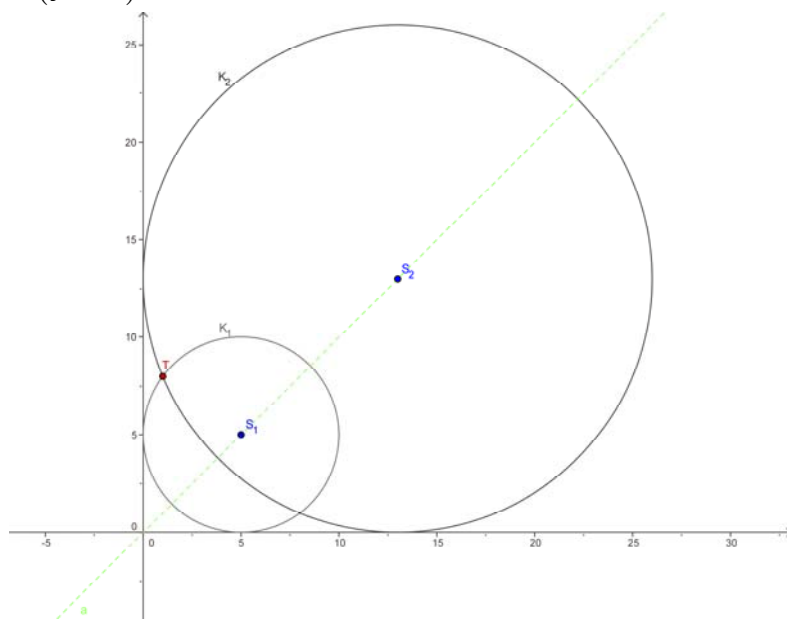
$$\text{Namig: Zrcalimo središče, ohranimo polmer. } (x-2)^2 + (y-\sqrt{5})^2 = 9,$$

$$P_1(4, 0), P_2(4, 2\sqrt{5})$$

7. naloga

$$\mathcal{K}_1 : r_1 = 5, (x-5)^2 + (y-5)^2 = 25$$

$$\mathcal{K}_2 : r_2 = 13, (x-13)^2 + (y-13)^2 = 169$$



8. naloga

$$x^2 + y^2 - 2x - 4y - 5 = 0$$

$$(x-1)^2 + (y-2)^2 = 10$$

9. naloga

$$x^2 + y^2 - 7x + y = 0$$

10. naloga

$$y^2 = x$$

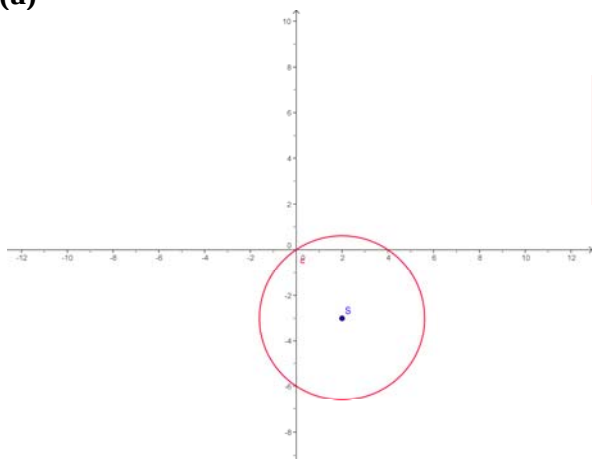
$$y = x - 2$$

$$P_1(1, -1), P_2(4, 2)$$

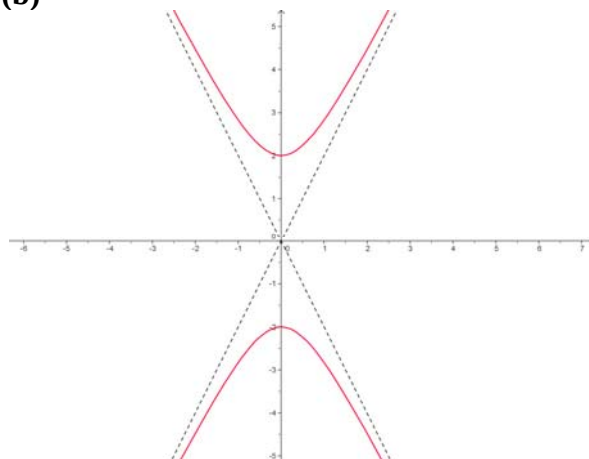
$$d(P_1, P_2) = 3\sqrt{2}$$

11. naloga

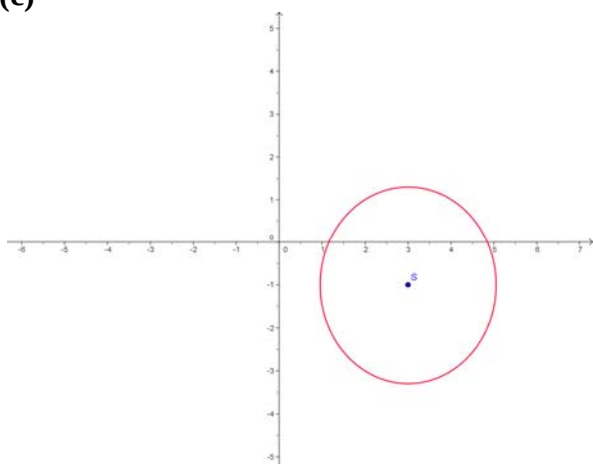
(a)



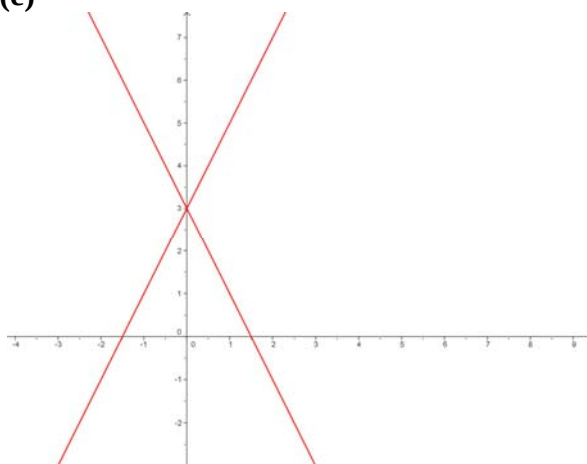
(b)



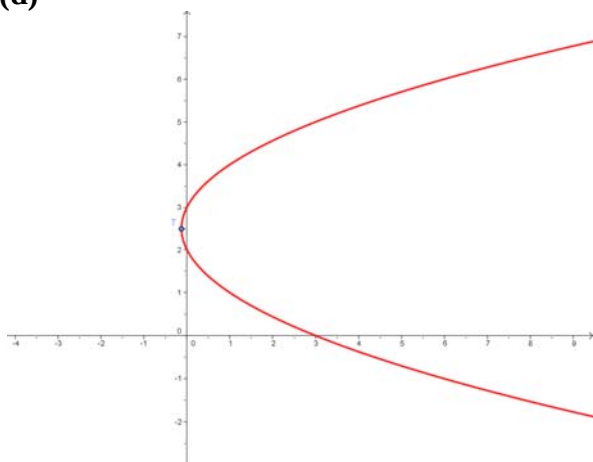
(c)



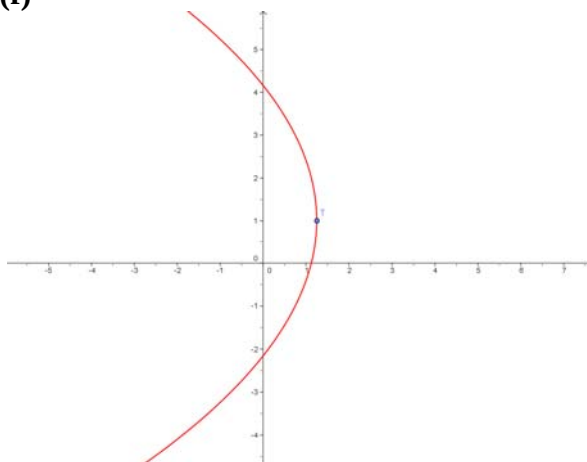
(e)



(d)



(f)



12. naloga

(a) $x^2 + (y + 2)^2 = 18$, krožnica s središčem $S(0, -2)$ in $r = 3\sqrt{2}$.

(b) Natanko ena točka $O(0, 0)$.

(c) Nima nobene realne točke.

(d) $(x + 1)^2 + 4y^2 = 4$, elipsa s polosema $a = 2$, $b = 1$ in središčem $S(-1, 0)$.

(e) $3(x + 2)^2 - (y + 2)^2 = 12$, hiperbola s središčem $S(-2, -2)$ in polosema $a = 2$, $b = 2\sqrt{3}$.

(f) Unija premic $y = -x + 5$ in $y = x + 1$.

13. naloga

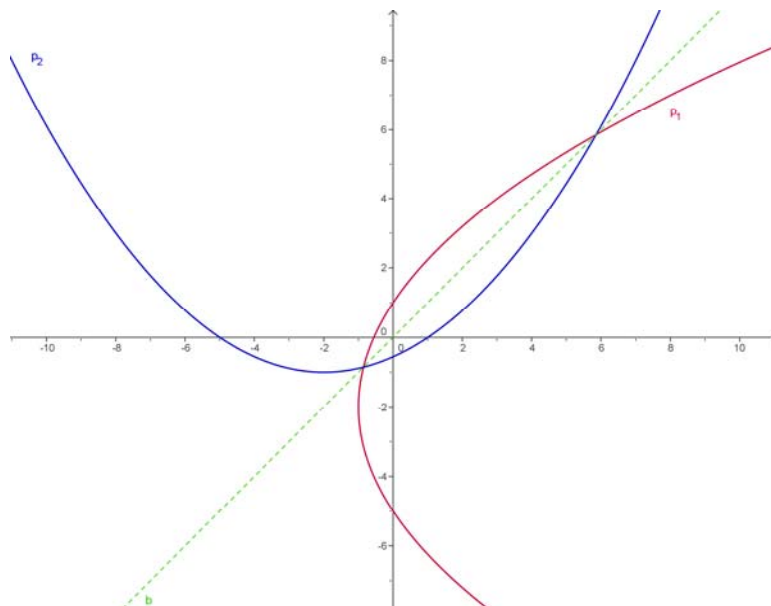
$$p = \frac{b^2}{a}$$

14. naloga

$F(1, 25; -2)$,

$x = -3, 25$,

$S(-1, -2)$

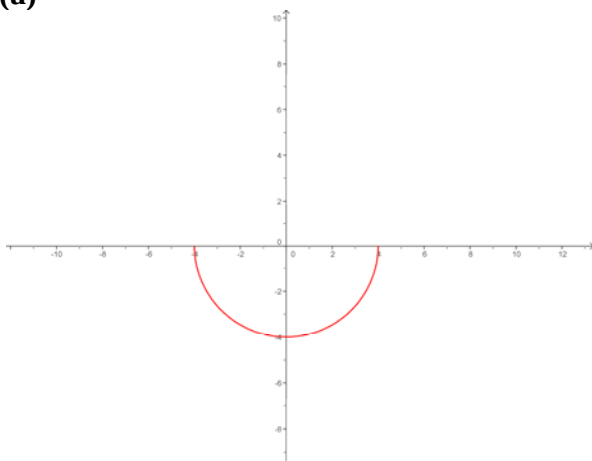


Enačba prezrcaljene parabole:

$$y = \frac{1}{9}x^2 + \frac{4}{9}x - \frac{5}{9}$$

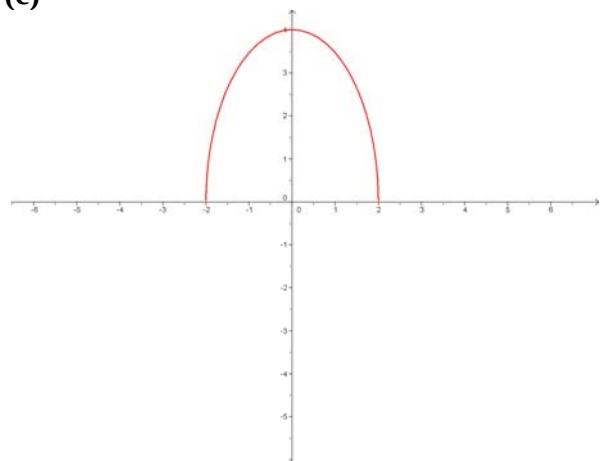
15. naloga

(a)



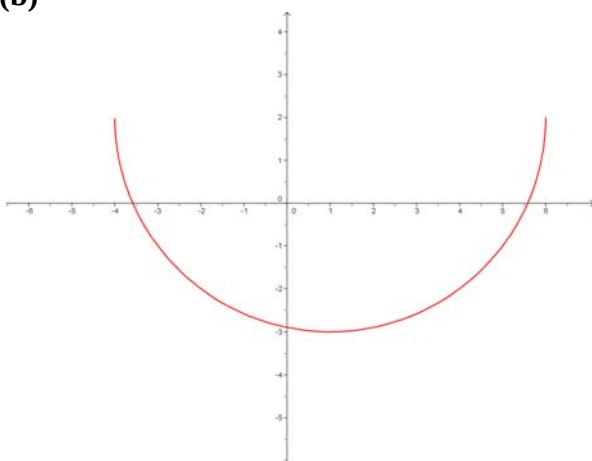
$$D_f = [-4, 4], \quad Z_f = [-4, 0]$$

(c)



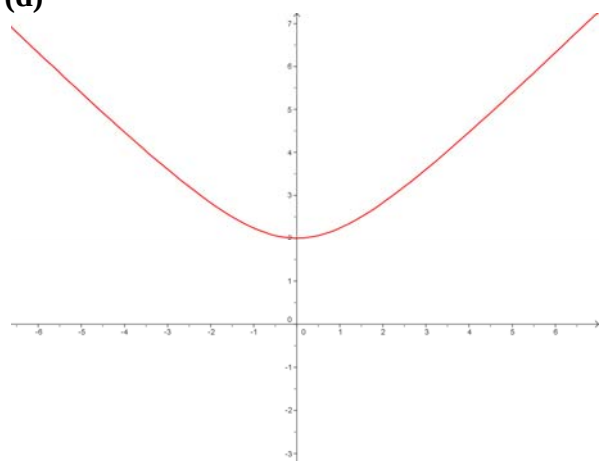
$$D_f = [-2, 2], \quad Z_f = [0, 4]$$

(b)



$$D_f = [-4, 6], \quad Z_f = [-3, 2]$$

(d)



$$D_f = \mathbb{R}, \quad Z_f = [2, \infty)$$

16. naloga

$$S(0, 0)$$

$$\frac{x^2}{36} + \frac{y^2}{9} = 1$$

$$S = 18\pi$$

17. naloga

$$F_1(-5, 2), F_2(3, 2) \Rightarrow S(-1, 2)$$

$$2e = 8 \Rightarrow e = 4$$

$$a^2 = b^2 + e^2 \text{ itd.}$$

$$\frac{(x+1)^2}{25} + \frac{(y-2)^2}{9} = 1$$

18. naloga

Nasvet: Razmisli o kakšnem štirikotniku je govora ...

$$S(0, 0), e = \sqrt{5}$$

$$\frac{x^2}{9} + \frac{y^2}{4} = 1$$