

$$1) f(x) = -(x+3)^2 + 4$$

$$g(x) = -f(x)$$

$$g(x) = -(-(x+3)^2 + 4) =$$

$$g(x) = (x+3)^2 - 4 = x^2 + 6x + 5 = (x+5)(x+1)$$

$$g: T(-3, -4)$$

$$x_1 = -5, x_2 = -1 \quad [graf \ g(x)]$$

$$A(0, 5), \cup$$

[f(x) graf]

$$5) f(x) = 2(x-3)^2 + (8-x)^2 + (x-2)^2$$

$$= 2x^2 - 12x + 18 + 64 - 16x + x^2 + x^2 - 4x + 4$$

$$= 4x^2 - 32x + 86$$

$$p = -\frac{b}{2a} = \frac{32}{8} = 4$$

Ze $x=4$ je vrednost $f(4) = 22$ najmanjša

$$6*) (m^2 + n^2 + p^2)x^2 + 2(m+n+p)x + 3 = 0$$

$$D = 4(m+n+p)^2 - 4(m^2 + n^2 + p^2) \cdot 3$$

$$= 4m^2 + 4n^2 + 4p^2 + 8mn + 8pm + 8mp - 12m^2 - 12n^2 - 12p^2 =$$

$$= -4(2m^2 + 2n^2 + 2p^2 - 2mn - 2mp - 2np) =$$

$$= -4((m^2 - 2mn + n^2) + (m^2 - 2mp + p^2) + (n^2 - 2np + p^2))$$

$$= -4((m-n)^2 + (m-p)^2 + (n-p)^2)$$

vsak dvočlen ≥ 0 , zato je $D < 0$ za vse m, n, p , torej $m=n=p$.

$$2) f(x) = x^2 + (m-1)x + (m+7)$$

$$D = 0$$

$$(m-1)^2 - 4(m+7) = 0$$

$$m^2 - 2m + 1 - 4m - 28 = 0$$

$$m^2 - 6m - 27 = 0$$

$$(m-9)(m+3) = 0$$

$$m_1 = 9$$

$$m_2 = -3$$

$$3) f(x) = ax^2 + bx + c, A(-1, -2), N(2, 19), P(0, -1)$$

$$M: -2 = a(-1)^2 + b(-1) + c$$

$$N: 19 = a \cdot 2^2 + b \cdot 2 + c$$

$$P: -1 = c \Rightarrow c = -1$$

$$a - b + 1 = 0 \quad | \cdot (+2)$$

$$+ \left\{ \begin{array}{l} 4a + 2b - 20 = 0 \\ + 2a - 2b + 2 = 0 \end{array} \right\} \Rightarrow 6a = 18$$

$$\underline{a = 3}$$

$$b = +a + 1 = 4$$

$$\Rightarrow f(x) = 3x^2 + 4x - 1$$

$$4) \frac{5\sqrt{3} - 3\sqrt{5}}{\sqrt{5} - \sqrt{3}} + \frac{5\sqrt{5}}{\sqrt{5} + \sqrt{3}} + 3\sqrt{15} =$$

$$a) \frac{(\sqrt{5} + \sqrt{3}) \cdot (5\sqrt{3} - 3\sqrt{5})}{(\sqrt{5} - \sqrt{3})(\sqrt{5} + \sqrt{3})} + \frac{5\sqrt{5}}{\sqrt{5} + \sqrt{3}} + 3\sqrt{15} =$$

$$= \frac{25 - 3\sqrt{15}}{2} + 3\sqrt{15} = \frac{25 + 3\sqrt{15}}{2}$$

$$b) \frac{3^{x+2} + 3^x + 2 \cdot 3^{x+1}}{3^{x+1} - 3^x} = \frac{3^{x-1}(3^3 + 3 + 2)}{3^x(3 - 1)} =$$

$$= 3^{x-1-x} \cdot \frac{32}{2} = 3^{-1} \cdot \frac{32}{2} = \frac{32}{6} = \frac{16}{3}$$