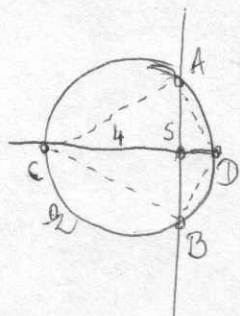


(1)



$$\overline{SC} = 4$$

$$\overline{AS} = 3$$

$$\overline{AS}^2 = \overline{CS} \cdot \overline{SD}$$

$$\Rightarrow \overline{SD} = \frac{\overline{AS}^2}{\overline{CS}} = \frac{9}{4} = 2\frac{1}{4}$$

$$\Rightarrow r = (\overline{CS} + \overline{SD})/2 = \frac{4 + 9/4}{2} = 3\frac{1}{8} \text{ cm}$$

$$\overline{AC}^2 = \overline{CS}^2 + \overline{AS}^2$$

$$\overline{AC} = \sqrt{4^2 + 3^2} = 5$$

4-kutunluk ABCD: tetivni  $\Rightarrow (\angle A = \angle B = 90^\circ)$   
 $\wedge (\angle C + \angle D = 180^\circ)$

Kosinusni izrek:  
 $\cos \angle C = \cos \gamma = \frac{\overline{AC}^2 + \overline{BC}^2 - \overline{AB}^2}{2 \cdot \overline{AC} \cdot \overline{BC}}$

$$= \frac{25 + 25 - 36}{2 \cdot 5 \cdot 5} = \frac{14}{50} = \frac{7}{25}$$

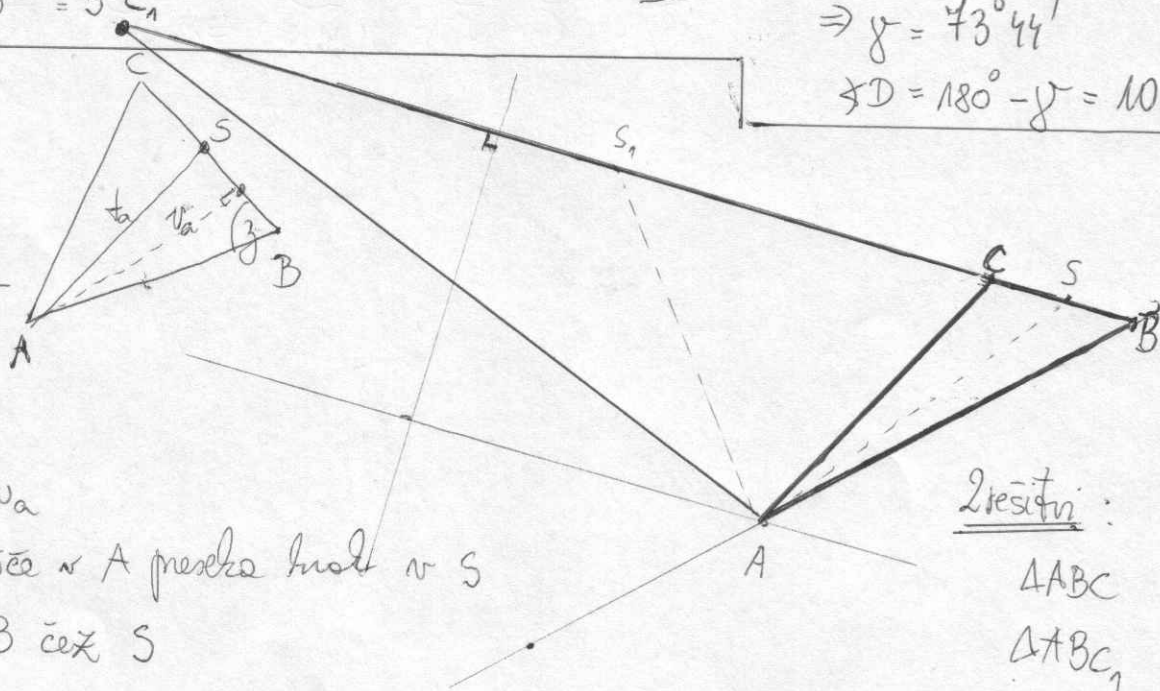
$$\Rightarrow \gamma = 73^\circ 44'$$

$$\angle D = 180^\circ - \gamma = 106^\circ 12'$$

(2)  $\gamma = 45^\circ$

$$r_a = 4 \text{ cm}$$

$$r_a = 5 \text{ cm}$$



1.  $\angle \gamma$

2. pas sinuse  $r_a$

3. kol: medijee  $r$  A presko knot  $r$  S

4. zrcoljenje B čez S

Rezultati:

$\triangle ABC$

$\triangle ABC_1$

(3)  $\triangle ABC$ :

$$a:b:c = 4:6:7$$

$$\Rightarrow \triangle ABC' \sim \triangle ABC \text{ in}$$

$$a':b':c' = 4:6:7$$

$$b' - a' = 4 \text{ cm} \Rightarrow 6t - 4t = 4$$

$$t = 2$$

$$\Rightarrow a' = 4t = 8 \text{ cm}, b' = 6t = 12 \text{ cm},$$

$$c' = 7t = 14 \text{ cm} \Rightarrow c' = 34 \text{ cm}$$

$$\text{ker } c = 28 \text{ cm} \Rightarrow \frac{c'}{c} = \frac{1}{2} = k$$

$$\Rightarrow \frac{s'}{s} = k^2 = \frac{1}{4} \Rightarrow \underline{s':s = 1:4}$$

(4)  $f(x) = x^2 + 7x + 6 = (x+6)(x+1)$

nicle:  $x_1 = -6, x_2 = -1$

sema:  $p = -\frac{b}{2a} = -\frac{7}{2}, q = -\frac{D}{4a} = \pi$

$$q = \frac{-(49-24)}{4 \cdot 1} = -\frac{25}{4} = -6\frac{1}{4}$$

$$T(-\frac{7}{2}, -\frac{25}{4})$$

vektors vrednost:  $A(0,6)$

$$g(x) = 2x^2 + 4x + 2 = 2(x+1)^2$$

nicle:  $x = -1 (2x)$

sema:  $T(-1,0)$ , vektors v.:  $T(0,2)$

Presečišče:  $g(x) = f(x)$

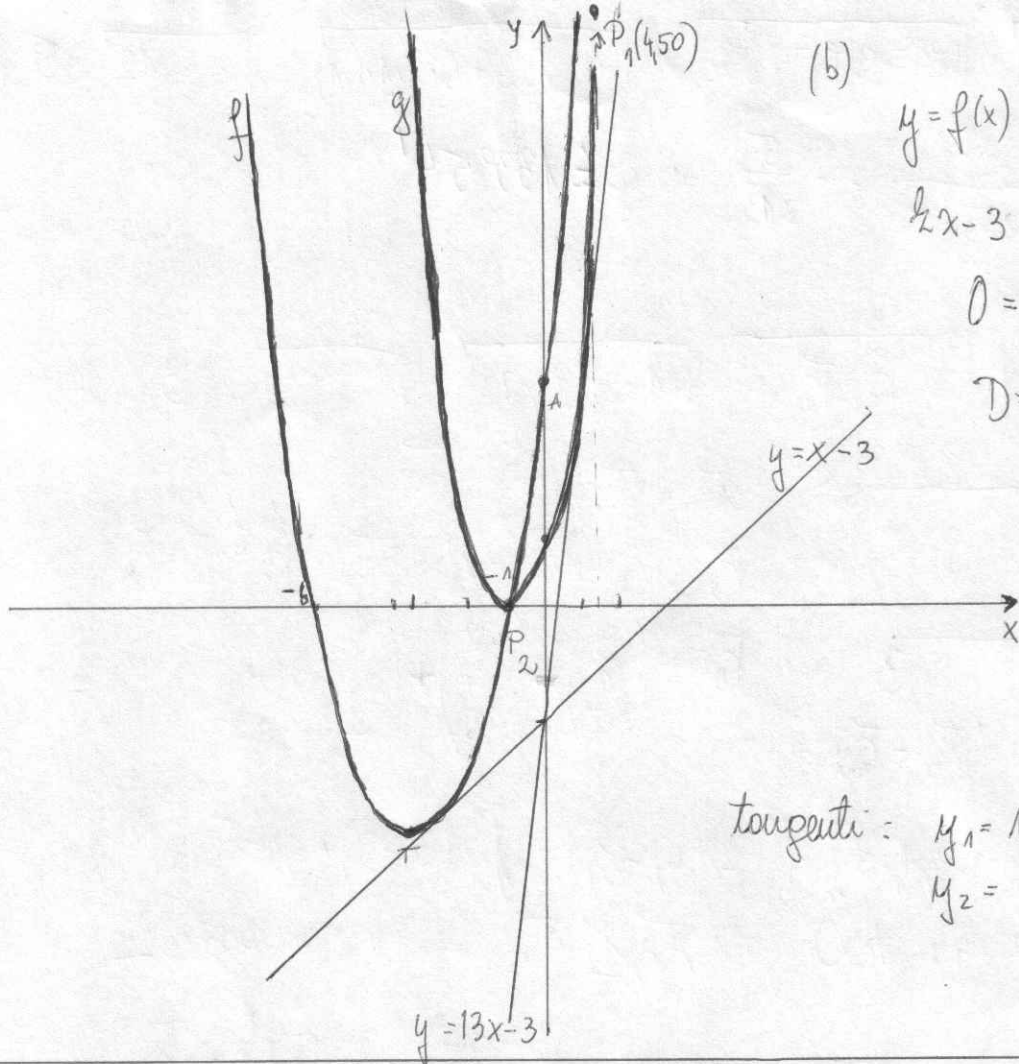
$$x^2 + 7x + 6 = 2x^2 + 4x + 2$$

$$0 \Leftrightarrow x^2 - 3x - 4 = 0$$

$$(x-4)(x+1) = 0 \quad P_1(4,50)$$

$$x_1 = 4, x_2 = -1 \quad P_2(-1,0)$$

$$y_1 = 50, y_2 = 0$$



(b)

$$y = f(x)$$

$$2x - 3 = x^2 + 7x + 6$$

$$0 = x^2 + (4 - k)x + 9$$

$$D = b^2 - 4ac = (7 - k)^2 - 36 = 0$$

$$(7 - k)^2 = 36$$

$$7 - k = \pm 6$$

$$k_1 = +13$$

$$k_2 = +1$$

tangenti:  $y_1 = 13x - 3$

$$y_2 = x - 3$$

(5)  $(-3x^2 - 2x + 1 \leq 0) \wedge (x^2 + x - 2 > 0)$

$$x_{1,2} = \frac{2 \pm \sqrt{4 + 12}}{-6} =$$

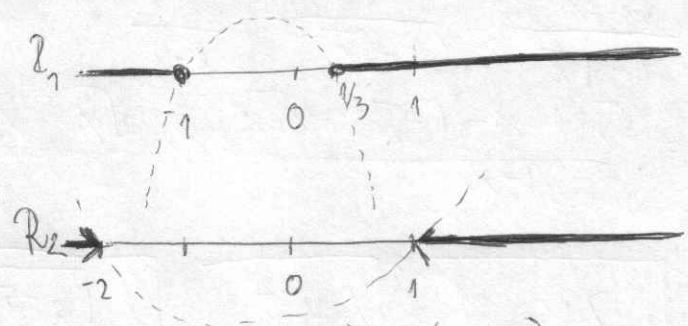
$$= \frac{2 \pm 4}{-6}$$

$$x_1 = -1, x_2 = 1/3$$

$$(x+2)(x-1) > 0$$

$$x_1 = -2$$

$$x_2 = 1$$



$$R = R_1 \cap R_2 = (-\infty, -2) \cup (1, \infty)$$

(6)  $\angle(\vec{a}, \vec{b}) = 120^\circ$

$$\angle(\vec{a}, \vec{c}) = 60^\circ$$

$$\angle(\vec{b}, \vec{c}) = 180^\circ$$

$$|\vec{a}| = 3, |\vec{b}| = 2, |\vec{c}| = 1$$

(a)  $\vec{a} \cdot (\vec{b} + \vec{c}) = \vec{a} \cdot \vec{b} + \vec{a} \cdot \vec{c} = |\vec{a}| \cdot |\vec{b}| \cdot \cos 120^\circ +$

$$+ |\vec{a}| \cdot |\vec{c}| \cdot \cos 60^\circ =$$

$$= 3 \cdot 2 \cdot (-1/2) + 3 \cdot 1 \cdot (1/2) =$$

$$= -3 + 3/2 = -3/2$$

$$|2\vec{a} - \vec{b}| = \sqrt{(2\vec{a} - \vec{b}) \cdot (2\vec{a} - \vec{b})}$$

$$= \sqrt{4|\vec{a}|^2 + |\vec{b}|^2 - 4\vec{a} \cdot \vec{b}}$$

$$= \sqrt{4 \cdot 9 + 4 - 4 \cdot 3 \cdot 2 \cdot (-1/2)} =$$

$$= \sqrt{40 + 12} = \sqrt{52} = 2\sqrt{13}$$

(b)  $(2\vec{a} - \vec{b}) \cdot (\vec{c} + 3\vec{b}) = 2\vec{a} \cdot \vec{c} + 6\vec{a} \cdot \vec{b} - \vec{b} \cdot \vec{c} - 3\vec{b} \cdot \vec{b} =$

$$= 2 \cdot |\vec{a}| \cdot |\vec{c}| \cdot \cos 60^\circ + 6|\vec{a}| \cdot |\vec{b}| \cdot \cos 120^\circ - |\vec{b}| \cdot |\vec{c}| \cdot \cos 180^\circ - 3|\vec{b}|^2 =$$

$$= 2 \cdot 3 \cdot 1 \cdot 1/2 + 6 \cdot 3 \cdot 2 \cdot (-1/2) - 2 \cdot 1 \cdot (-1) - 3 \cdot 4 =$$

$$= 3 - 18 + 2 - 12 = -25$$

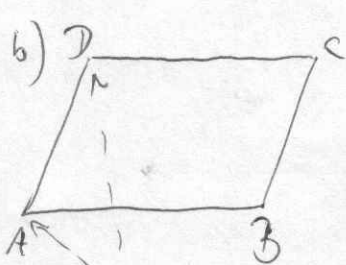
$$|(\vec{c}+3\vec{b})| = \sqrt{(\vec{c}+3\vec{b}) \cdot (\vec{c}+3\vec{b})} = \sqrt{|\vec{c}|^2 + 9|\vec{b}|^2 + 6\vec{b} \cdot \vec{c}} = \sqrt{1 + 36 + 6 \cdot 2 \cdot 1 \cdot (-1)} = \sqrt{37 - 12} = 5 \quad (\text{III})$$

$$\cos \varphi = \frac{(\vec{2a}-\vec{b}) \cdot (\vec{c}+3\vec{b})}{|\vec{2a}-\vec{b}| \cdot |\vec{c}+3\vec{b}|} = \frac{-25}{2\sqrt{13} \cdot 5} = -\frac{5}{2\sqrt{13}} \Rightarrow \varphi \approx 133^\circ 54'$$

(7)  $A(3, 1, -5)$  a)  $|\vec{r}_c| = \sqrt{\vec{r}_c \cdot \vec{r}_c} = \sqrt{(1, -2, 2) \cdot (1, -2, 2)} = \sqrt{1 + 4 + 4} = 3$

$B(-2, 7, 6)$

$C(1, -2, 2)$



$\vec{AB} = \vec{DC}, \vec{AD} = \vec{BC}$

$\vec{r}_D = \vec{r}_A + \vec{AD} = \vec{r}_A + \vec{BC} = \vec{r}_A + \vec{r}_C - \vec{r}_B$

$\vec{r}_D = \begin{pmatrix} 3 \\ 1 \\ -5 \end{pmatrix} + \begin{pmatrix} -2 \\ 7 \\ 6 \end{pmatrix} - \begin{pmatrix} 1 \\ -2 \\ 2 \end{pmatrix} = \begin{pmatrix} 6 \\ 8 \\ -9 \end{pmatrix}$

$\vec{AD} \cdot \vec{AB} = (\vec{r}_D - \vec{r}_A) \cdot (\vec{r}_B - \vec{r}_A) =$

$= ((6, 8, -9) - (3, 1, -5)) \cdot ((-2, 7, 6) - (3, 1, -5)) = (3, -9, 4) \cdot (-5, 6, 11) =$

$= -15 - 99 + 44 \neq 0 \Rightarrow \vec{AB} \not\perp \vec{AD} \Rightarrow \text{NI Pravočrtnik}$

(8)

a)  $\frac{\sqrt{x}-x}{1-\sqrt{x}} - \frac{1}{1+\sqrt{x}} + \frac{x\sqrt{x}}{1-x} = \frac{\sqrt{x}(1-\sqrt{x})(1+\sqrt{x}) - (1-\sqrt{x}) + x\sqrt{x}}{(1-\sqrt{x})(1+\sqrt{x})} =$   
 $= \frac{\sqrt{x}(1-x) - (1-\sqrt{x}) + x\sqrt{x}}{1-x} = \frac{\sqrt{x} - x\sqrt{x} - 1 + \sqrt{x} + x\sqrt{x}}{1-x} = \frac{2\sqrt{x}-1}{1-x}$

b)  $\sqrt[6]{xy^3} \cdot \sqrt[3]{x^2y^{-2}} \cdot \sqrt{x\sqrt[3]{x^{-5}y^8}} = \sqrt[6]{x^3y^9 \cdot x^4y^{-4} \cdot x^{-3}x^5y^{-8}} =$

$= \sqrt[6]{x^9y^{-3}} = \sqrt[6]{y^{-1}x^3}$

c)  $\frac{x^2-9}{x^{m+1}-3x^m} - \frac{x^2-4}{x^{n+1}+2x^n} = \frac{(x^2+3)(x-3)}{x^m(x-3)} - \frac{(x+2)(x-2)}{x^n(x+2)} =$   
 $= \frac{x+3}{x^m} - \frac{x-2}{x^n} = \frac{x+3-x+2}{x^m} = \frac{5}{x^m}$

(9)

$x$ ... število dijakov

vsaki plača  $\frac{120000}{x}$ , če so vsi

vsaki plača  $\frac{120000}{x-3} + 2000$ , če tiče manjši

$\Rightarrow$  Vse dijakov je bilo 18.

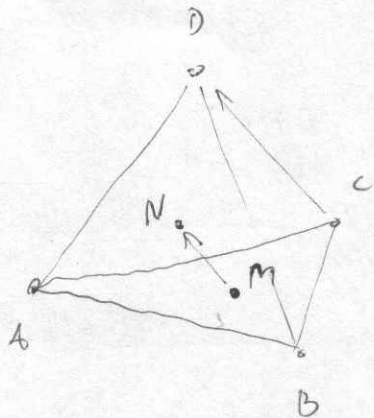
$\Rightarrow \frac{120000}{x} = \frac{120000}{x-3} + 2000$

$-360000 = x^2 \cdot 2000 - 6000x$

$0 = x^2 - 3x + 180$

$x_{1,2} = \frac{3 \pm \sqrt{9+720}}{2} = \frac{3 \pm 27}{2} = 18$

$\leftarrow x_2 < 0$



$$\underline{\underline{MN \parallel CD}}$$

$$\vec{r}_M = \frac{1}{3}(\vec{r}_A + \vec{r}_B + \vec{r}_C)$$

$$\vec{r}_N = \frac{1}{3}(\vec{r}_A + \vec{r}_B + \vec{r}_D)$$

$$\vec{MN} = \frac{1}{3}\vec{r}_A + \frac{1}{3}\vec{r}_B + \frac{1}{3}\vec{r}_D - \frac{1}{3}\vec{r}_A - \frac{1}{3}\vec{r}_B - \frac{1}{3}\vec{r}_C = \frac{1}{3}\vec{r}_D - \frac{1}{3}\vec{r}_C$$

$$\vec{CD} = \vec{r}_D - \vec{r}_C = 3 \cdot \vec{MN} \Rightarrow \vec{CD} \parallel \vec{MN} \Rightarrow \underline{\underline{MN \parallel CD}}$$

IV.