A CSOPORT:

① a) $T_n(x) = f(a) + f'(a)\cdot(x-a) + \frac{f''(a)}{2!}\cdot(x-a)^2 + \ldots + \ldots + \frac{f^{(n)}(a)}{n!}\cdot(x-a)^n$

$$\boxed{R_n(x) = f(x) - T_n(x)}$$

TAYLOR-TÉTEL: LÁSD SZEKERNECI JEGYZET 105. OLDAL ALJA.

① b) (LÁSD 103. OLDAL)

$$T_1(x) = f(5) + f'(5)\cdot(x-5) = 2 + (-1)\cdot(x-5) = 7 - x$$

$$R_1(x) = f(x) - T_1(x) = x^2 - 11x + 32 - (7-x) = x^2 - 10x + 25 \overset{\star}{=} (x-5)^2$$

$$|f(7) - T_1(7)| = |R_1(7)| \underset{\text{TAYLOR-TÉTEL}}{\leq} \max_{5 \leq b \leq 7} \left| \frac{f''(b)}{2!}\cdot(x-5)^2 \right| =$$

$$= \max_{5 \leq b \leq 7} \left| \frac{2}{2!}\cdot(x-5)^2 \right| = \max_{5 \leq b \leq 7} (x-5)^2 = (7-5)^2 = \underbrace{4}_{\text{BECSLÉS}}$$

$$R_1(7) \overset{\star}{=} (7-5)^2 = 4 \leftarrow \boxed{\text{TÉNYLEGES ÉRTÉK}}$$

1. OLDAL

② $6x_0^2+3x_0\cdot y_0+2y_0^2+17y_0-6=0$?

$6\cdot(-1)^2+3\cdot(-1)\cdot 0-2\cdot 0^2+17\cdot 0-6=0$?

$6-6=0$ ✓ TÉNYLEG ILLESZKEDIK!

$$6x^2+3x\cdot y(x)+2y^2(x)+17y(x)-6=0$$

DERIVÁLJUK MINDKÉT OLDALT:

$$12x+3y(x)+3x\cdot y'(x)+4y(x)\cdot y'(x)+17\cdot y'(x)=0$$

BEHELYETTESÍTJÜK $\boxed{x_0=-1}$-ET ÉS $\boxed{y(x_0)=0}$-T:

$$12\cdot(-1)+3\cdot 0+3\cdot(-1)\cdot y'(x_0)+4\cdot 0\cdot y'(x_0)+17\cdot y'(x_0)=0$$

$$-12-3\cdot y'(x_0)+17\cdot y'(x_0)=0$$

$14y'(x_0)=12$ AZAZ $\boxed{y'(x_0)=\frac{6}{7}}$ ← ÉRINTŐ EGYENES MEREDEKSÉGE

EGYENES EGYENLETE: $y-y_0=m\cdot(x-x_0)$ AZAZ

$y-0=\frac{6}{7}\cdot(x-(-1))$ AZAZ $\boxed{y=\frac{6}{7}\cdot(x+1)}$

(3) $f(x)=\sqrt{2x-x^2}$

$$f'(x)=\frac{1}{2}\cdot\frac{1}{\sqrt{2x-x^2}}\cdot(2-2x)=\frac{1-x}{\sqrt{2x-x^2}}$$

$$f''(x)=\frac{(1-x)'\cdot\sqrt{2x-x^2}-(1-x)\cdot\frac{1}{2}\cdot(2x-x^2)^{-\frac{1}{2}}\cdot(2-2x)}{\sqrt{2x-x^2}^{\,2}}=$$

$$=\frac{-\sqrt{2x-x^2}-(1-x)^2\cdot(2x-x^2)^{-\frac{1}{2}}}{2x-x^2}$$

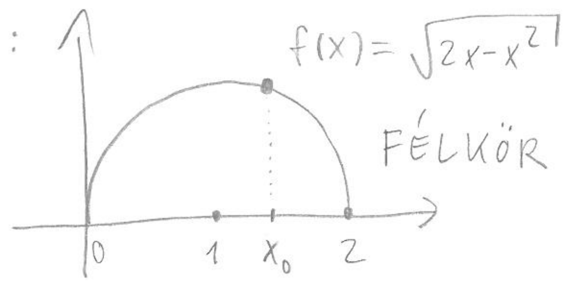
$$f'(x_0)=\frac{1-3/2}{\sqrt{2\cdot 3/2-(3/2)^2}}=\frac{-1/2}{\sqrt{3-9/4}}=\frac{-1/2}{\sqrt{3/4}}=\frac{-1}{\sqrt{3}}$$

$$f''(x_0)=\frac{-\sqrt{3-(3/2)^2}-\left(1-\frac{3}{2}\right)^2\cdot\left(3-\frac{9}{4}\right)^{-\frac{1}{2}}}{3-9/4}=$$

$$=\frac{-\sqrt{3/4}-1/4\cdot\left(\frac{3}{4}\right)^{-\frac{1}{2}}}{3/4}=\frac{-3/4-1/4}{\sqrt{3/4}\cdot(3/4)}=\frac{-1}{(3/4)^{3/2}}=-\left(\frac{4}{3}\right)^{3/2}$$

$$\boxed{G(x_0)=\frac{-\left(\frac{4}{3}\right)^{3/2}}{\left(1+\frac{1}{3}\right)^{3/2}}=-1}$$

MEGJ.:



↑ A KERESETT GÖRBÜLET

④ a) $\int \frac{x^3 - x + 1}{\sqrt{x}} dx = \int \left(x^{5/2} - x^{1/2} + x^{-1/2}\right) dx$

$= \frac{1}{\frac{5}{2}+1} \cdot x^{\frac{5}{2}+1} - \frac{1}{\frac{1}{2}+1} \cdot x^{\frac{1}{2}+1} + \frac{1}{-\frac{1}{2}+1} \cdot x^{-\frac{1}{2}+1} + C =$

$= \frac{2}{7} \cdot x^{7/2} - \frac{2}{3} \cdot x^{3/2} + 2 \cdot \sqrt{x} + C$

---

④ b) $\int x^2 \cdot sh\left(\frac{x}{2}\right) dx =$ PARCIÁLIS INT

$= x^2 \cdot 2 \cdot ch\left(\frac{x}{2}\right) - \int 2x \cdot 2\, ch\left(\frac{x}{2}\right) dx =$

$= x^2 \cdot 2 \cdot ch\left(\frac{x}{2}\right) - 4 \cdot \int x \cdot ch\left(\frac{x}{2}\right) dx =$ PARCIÁLIS INT

$= 2x^2 \cdot ch\left(\frac{x}{2}\right) - 4 \cdot \left(x \cdot 2 \cdot sh\left(\frac{x}{2}\right) - \int 2 \cdot sh\left(\frac{x}{2}\right) dx\right)$

$= 2x^2 \cdot ch\left(\frac{x}{2}\right) - 8x \cdot sh\left(\frac{x}{2}\right) + 16\, ch\left(\frac{x}{2}\right) + C$

$= \left(2x^2 + 16\right) \cdot ch\left(\frac{x}{2}\right) - 8x \cdot sh\left(\frac{x}{2}\right) + C$