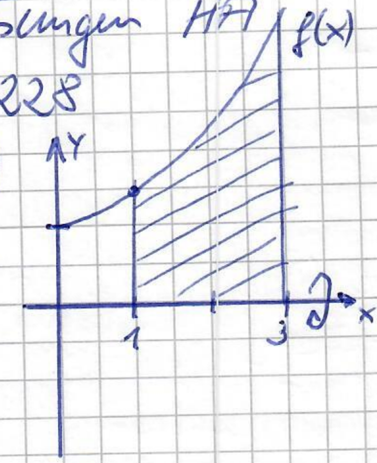
Lösungen HA

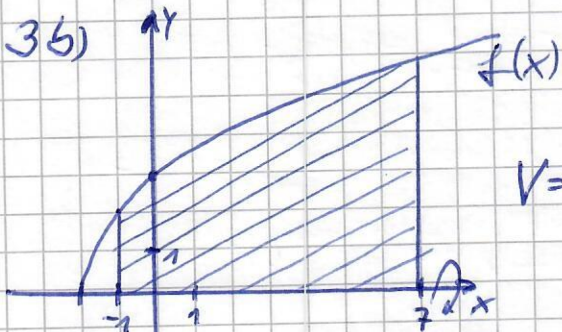
S. 228

3a)



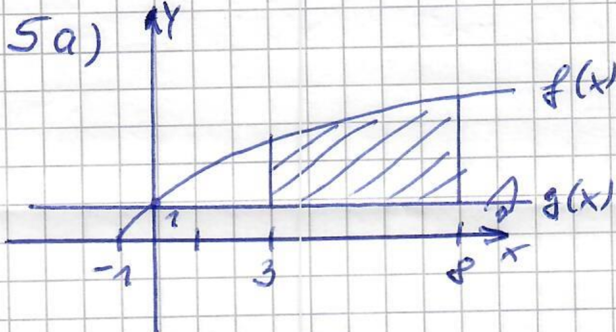
$$V = \pi \cdot \int_1^3 \left(\frac{1}{2}x^2+1\right)^2 dx = \frac{683}{30}\pi \approx \underline{\underline{71{,}5\ VE}}$$

3b)



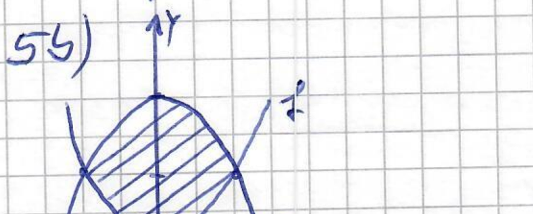
$$V = \pi \cdot \int_{-1}^{7} \left(3\sqrt{x+2}\right)^2 dx = 360\pi \approx \underline{\underline{1131\ VE}}$$

5a)



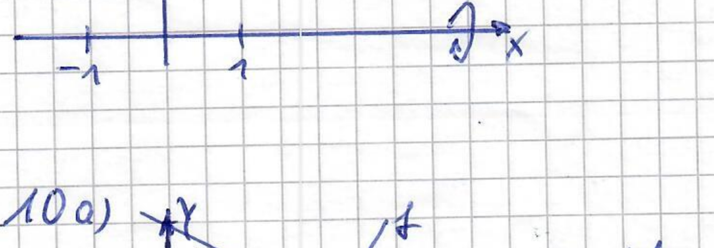
$$V = \pi \cdot \int_3^8 \left(\sqrt{x+1}\right)^2 - (1)^2\, dx = \frac{55}{2}\pi$$
$$\approx \underline{\underline{86{,}4\ VE}}$$

5b)



$$V = \pi \cdot \int_{-1}^{1} (-x^2+3)^2 - (x^2+1)^2\, dx = 10\tfrac{2}{3}\pi$$
$$\approx \underline{\underline{33{,}51\ VE}}$$

10a)



$$V = \pi \int_0^2 \left(\frac{1}{2}x^2\right)^2 dx + \pi \cdot \int_2^6 \left(-\frac{1}{2}x+3\right)^2 dx$$

$$\approx \underline{\underline{21{,}78\ VE}}$$

NR: $\frac{1}{2}x^2 = -\frac{1}{2}x + 3 \wedge x_s = 2$

Nst: g(x) bei $x_0 = 6$

13)

I $\approx 14{,}137$	IV $\approx 13{,}79$
II $\approx 14{,}137$	V $\approx 16{,}93$
III $\approx 14{,}137$	

S. 228/13

I) $V = \pi \cdot \int_0^{1,5} 2^2 - 1^2 \, dx = \pi \cdot \int_0^{1,5} 3 \, dx = \pi \cdot \left[3x\right]_0^{1,5} = \underline{\underline{4,5\pi \text{ VE}}}$

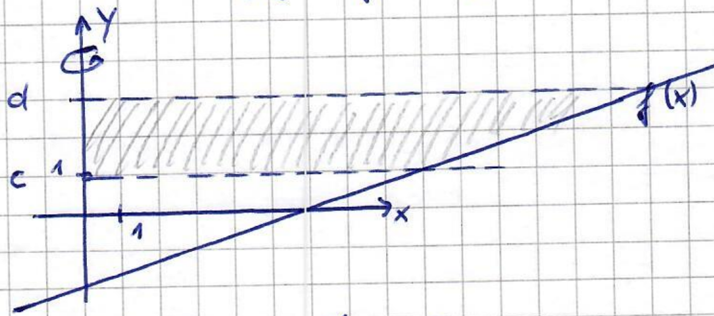
II) $V = \pi \cdot \int_2^{3,5} 2,5^2 - (x-1)^2 \, dx \approx \underline{\underline{14,137 \text{ VE}}} \; (= 4,5\pi \text{ VE})$

III) $V = \pi \cdot 2 \cdot \int_{2,5}^{4} (x-2)^2 - 0,5^2 \, dx \approx \underline{\underline{14,137 \text{ VE}}} \; (= 4,5\pi \text{ VE})$

IV) $V = \pi \cdot \int_{5,5}^{7,5} \left(e^{\frac{1}{2}(x - \frac{11}{2})}\right)^2 - 1^2 \, dx \approx \underline{\underline{13,79 \text{ VE}}}$

V) $V = \pi \cdot \int_{7,75}^{10,25} \left(2 - (x-9)^2\right)^2 - 0,5^2 \, dx \approx \underline{\underline{16,93 \text{ VE}}}$

S. 228/7a geg.: $f(x) = \frac{1}{3}x - 2$, $c = 1$; $d = 3$



$V = \pi \cdot \int_1^3 \left[3x+6\right]^2 dx$

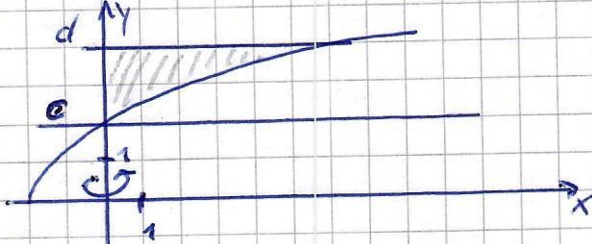
$V = \pi \int_1^3 \left[3x+6\right]^2 dx \approx \underline{\underline{923,6 \text{ VE}}}$

NR: $y = \frac{1}{3}x - 2$

$y + 2 = \frac{1}{3}x$

$3y + 6 = x \curvearrowright \underline{\underline{\bar{f}(x) = \bar{y} = 3x + 6}}$

7c geg.: $f(x) = \sqrt{2x+4}$, $c = 2$; $d = 4$ $\quad V = \pi \cdot \int_2^4 \left[\bar{f}(x)\right]^2 dx$



$y = \sqrt{2x+4} \quad |()^2$

$y^2 = 2x + 4$

$y^2 - 4 = 2x$

$\frac{1}{2}y^2 - 2 = x \curvearrowright \underline{\bar{f}(x) = \frac{1}{2}x^2 - 2}$

$\underline{\underline{V \approx 63,67 \text{ VE}}}$