

35 (1211) $\int_2^5 (ax+b) dx = \frac{ax^2}{2} + bx \Big|_2^5 = 10.5a + 3b$

12911 = $\int_2^5 (ax+b)^2 dx = \int_2^5 (a^2x^2 + 2abx + b^2) dx = \frac{a^2x^3}{3} + abx^2 + b^2x \Big|_2^5 = \frac{1}{3}(39a^2 + 21ab + 3b^2)$

$\begin{cases} 19.5 = 10.5a + 3b \rightarrow \boxed{b = 6.5 - 3.5a} \\ 129 = 39a^2 + 21a(6.5 - 3.5a) + 3(6.5 - 3.5a)^2 \end{cases}$

$2.25a^2 = 2.25$

$a = \pm 1 \rightarrow \begin{cases} a=1 \\ b=3 \end{cases}$

36 (1211) $\int_0^a \left(\sqrt{\frac{x}{a^2} - \frac{x^2}{a^3}} \right)^2 dx = \int_0^a \left(\frac{x}{a^2} - \frac{x^2}{a^3} \right) dx$

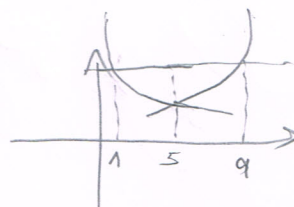
$= \frac{1}{a^2} \left(\frac{x^2}{2} - \frac{x^3}{3a} \right) \Big|_0^a = \frac{1}{a^2} \left(\frac{a^2}{2} - \frac{a^3}{3a} \right) = \frac{1}{6}$

מילוי נקודות
 $\sqrt{\frac{x}{a^2} - \frac{x^2}{a^3}} = 0$
 $x=0, x=a$

37 (1211) (1) $2511 = \int_0^A (\sqrt{x})^2 dx + \int_0^A (\sqrt{A-x})^2 dx = \frac{x^2}{2} \Big|_0^A + \frac{A^2 - x^2}{2} \Big|_0^A = \frac{A^2}{2} + \frac{A^2}{2} = A^2$

$A^2 = 100 \rightarrow A = \pm 10 \rightarrow \boxed{A=10}$

(2) $\int_1^5 \left(1 - \frac{1}{\sqrt{x}}\right) dx + \int_5^9 \left(1 - \frac{1}{\sqrt{10-x}}\right) dx = \left(x - 2\sqrt{x}\right) \Big|_1^5 + \left(x - 2\sqrt{10-x}\right) \Big|_5^9 = (5-2\sqrt{5}) - (1-2) + (9-2\sqrt{1}) - (5-2\sqrt{5}) = 12-4\sqrt{5} = 3.055$



38 (1211) $V_1 = \int_0^b (-x^2 + 2bx) dx = \frac{1}{3}b^3$

(2b,0): נקודת חיתוך, (b,b): נקודת חיתוך
 $y=x$: קו ישר

$= \int_0^b (x^4 - 4bx^3 + 4b^2x^2) dx = \frac{x^5}{5} - bx^4 + \frac{4b^2x^3}{3} \Big|_0^b = \frac{b^5}{5} - \frac{4b^5}{3} + \frac{4b^5}{3} = \frac{1}{5}b^5$

$V_2 = \int_0^b (x^2) dx + \int_b^{2b} (-x^2 + 2bx) dx = \frac{x^3}{3} \Big|_0^b + \frac{1}{3} \left(\frac{x^5}{5} - bx^4 + \frac{4b^2x^3}{3} \right) \Big|_b^{2b} = \frac{13}{15}b^5$

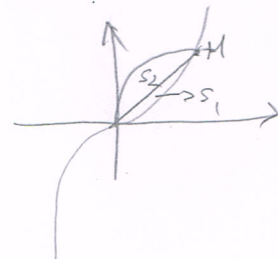
$\frac{V_1}{V_2} = \frac{\frac{1}{5}b^5}{\frac{13}{15}b^5} = \frac{3}{13}$

39 (1211) (1) $ax = x^3 \rightarrow x=0, x=\sqrt{a}$

חיתוך ב-1, x^3 חיתוך ב- $\sqrt{a}$
חיתוך ב- $\sqrt{a}$ (חיתוך) $ax = 1$ $\sqrt{a}x$

$a\sqrt{a} = \sqrt{a}a \rightarrow \boxed{b = a^3\sqrt{a}}$

(2) $V_1 = \int_0^{\sqrt{a}} (ax)^2 dx = \frac{a^3}{3} \sqrt{a}$, $V_2 = \int_0^{\sqrt{a}} (\sqrt{a}x)^2 dx = \frac{1}{3}a^3\sqrt{a}$



$\frac{V_1}{V_2} = \frac{\frac{4}{21}a^3\sqrt{a}}{\frac{1}{3}a^3\sqrt{a}} = \frac{4}{7}$