

13
(798)

$$y = x^3 - 3x$$

$$0 = x^3 - 4x = x(x^2 - 4)$$

$$x = 0, x = 2, x = -2$$

נתחיל מן השמאל

$$\int_0^2 [(x^3 - 3x) - x] dx + \int_{-2}^0 [x - (x^3 - 3x)] dx =$$

$$\int_{-2}^0 (x^3 - 4x) dx + \int_0^2 (4x - x^3) dx = \left. \frac{x^4}{4} - 2x^2 \right|_{-2}^0 + \left. 2x^2 - \frac{x^4}{4} \right|_0^2 = [0 - (16 - 8)] + [(8 - 16) - 0] = 8$$

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(798)

$$x = 0, x = 3, x = -3 \leftarrow y = x^3 - 9x + 4$$

נתחיל מן השמאל

$$\int_0^3 [(x^3 - 9x + 4) - 4] dx + \int_{-3}^0 [4 - (x^3 - 9x + 4)] dx = \int_0^3 (x^3 - 9x) dx + \int_{-3}^0 (-x^3 + 9x) dx = \left. \frac{x^4}{4} - \frac{9x^2}{2} \right|_0^3 + \left. -\frac{x^4}{4} + \frac{9x^2}{2} \right|_{-3}^0$$

$$= [0 - (\frac{81}{4} - \frac{81}{2})] - [(-\frac{81}{4} + \frac{81}{2}) - 0] = 40\frac{1}{2}$$

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(798)

$$\frac{1}{4}x^3 - x = 0 \leftarrow -x + 3 = \frac{1}{4}x^3 - 2x + 3$$

$$x = 0, x = 2, x = -2$$

נתחיל מן השמאל

$$\int_{-2}^0 [(\frac{1}{4}x^3 - 2x + 3) - (-x + 3)] dx + \int_0^2 [(-x + 3) - (\frac{1}{4}x^3 - 2x + 3)] dx = \int_{-2}^0 (\frac{1}{4}x^3 - x) dx + \int_0^2 (-\frac{1}{4}x^3 + x) dx =$$

$$\left. \frac{x^4}{16} - \frac{x^2}{2} \right|_{-2}^0 + \left. -\frac{x^4}{16} + \frac{x^2}{2} \right|_0^2 = [0 - (\frac{16}{16} - \frac{4}{2})] + [(-\frac{16}{16} + \frac{4}{2}) - 0] = 2$$

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(798)

$$x^3 + x^2 - 2x = 0 \leftarrow x^3 = -x^2 + 2x$$

$$x(x^2 + x - 2) = 0$$

$$x = 0, x = 1, x = -2 \rightarrow (0, 0) (1, 1) (-2, -8)$$

נתחיל מן השמאל (1)

$$\int_0^1 [x^3 - (-x^2 + 2x)] dx + \int_{-2}^1 [(-x^2 + 2x) - x^3] dx = \int_0^1 (x^3 + x^2 - 2x) dx + \int_{-2}^1 (-x^3 - x^2 + 2x) dx =$$

$$\left. \frac{x^4}{4} + \frac{x^3}{3} - x^2 \right|_0^1 + \left. -\frac{x^4}{4} - \frac{x^3}{3} + x^2 \right|_{-2}^1 = [0 - (\frac{16}{4} - \frac{8}{3} - 4)] + [-\frac{1}{4} - \frac{1}{3} + 1 - 0] = 3\frac{1}{12}$$

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(798)

$$(1) -x^2 + 4x = -x + 4 \rightarrow -x^2 + 5x - 4 = 0 \rightarrow x = 4, x = 1$$

$$(2) S_1 = \int_1^4 [(-x^2 + 4x) - (-x + 4)] dx = \int_1^4 (-x^2 + 5x - 4) dx = \left. -\frac{x^3}{3} + \frac{5x^2}{2} - 4x \right|_1^4 = (\frac{64}{3} + 40 - 16) - (-\frac{1}{3} + \frac{5}{2} - 4) = 4\frac{1}{2}$$

$$S_2 = \int_0^1 [(-x + 4) - (-x^2 + 4x)] dx = \int_0^1 (x^2 - 5x + 4) dx = \left. \frac{x^3}{3} - \frac{5x^2}{2} + 4x \right|_0^1 = (\frac{1}{3} - \frac{5}{2} + 4) - 0 = 1\frac{5}{6}$$

$$\frac{S_1}{S_2} = \frac{11}{27}$$