

$$\cdot \quad 3,600 \quad , \quad , \quad 80 \quad \cdot$$

$$\cdot \quad 3600:80 = \quad 45 : \quad$$

$$, \quad , \quad 65\%$$

$$\cdot \quad \frac{65}{100} \cdot 80 = 0.65 \cdot 80 = \quad 52$$

$$, \quad , \quad 40\%$$

$$\cdot \quad \frac{100+40}{100} \cdot 45 = 1.4 \cdot 45 = \quad 63$$

$$\cdot \quad .52 \cdot 63 = \quad 3276 : \quad$$

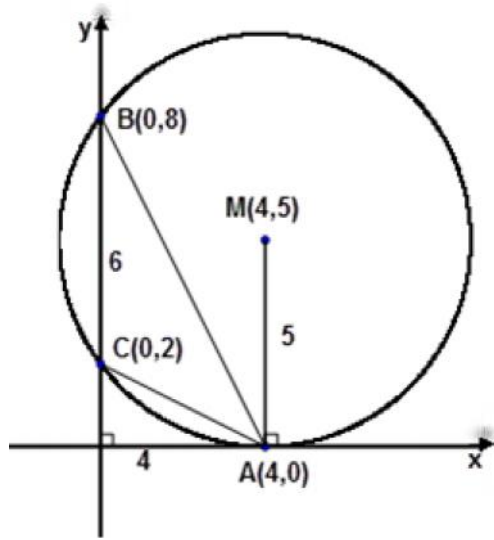
$$\cdot \quad 3,276 : \quad :$$

$$\cdot \quad \cdot \quad 63 \quad , \quad \cdot$$

$$\cdot \quad ,3600:63 = \quad 57.14 \quad , \quad 3,600$$

$$\cdot \quad , \quad 58 \quad ,$$

$$\cdot \quad .58 \quad :$$



•  $A(4,0)$   $x -$   $.$

,  $AM$   $, x -$   $,$

•  $R = y_M = 5 - x_M = x_A = 4$

•  $(x-4)^2 + (y-5)^2 = 25$   $:$

•  $x_B = x_C = 0$   $, C - B$   $y -$   $.$

•  $x = 0$

$(0-4)^2 + (y-5)^2 = 25$

$16 + (y-5)(y-5) = 25$

$16 + y^2 - 5y - 5y + 25 = 25$

$y^2 - 10y + 16 = 0$

$y_{1,2} = \frac{-(-10) \pm \sqrt{(-10)^2 - 4 \cdot 1 \cdot 16}}{2 \cdot 1}$

$y_{1,2} = \frac{10 \pm 6}{2}$

$y_1 = \frac{10+6}{2} = \frac{16}{2} = 8 = y_B \rightarrow \boxed{B(0,8)}$

$y_2 = \frac{10-6}{2} = \frac{4}{2} = 2 = y_C \rightarrow \boxed{C(0,2)}$

•  $C(0,2)$   $, B(0,8) :$

•  $m_{AC} = \frac{0-2}{4-0} = \frac{-2}{4} = -\frac{1}{2} : AC$   $.$

•  $-\frac{1}{2}$   $AC -$   $,$

•  $m = -\frac{1}{2}$   $M(4,5)$   $,$

$y-5 = -\frac{1}{2}(x-4)$

$y-5 = -\frac{1}{2}x+2$

$y = -\frac{1}{2}x+7$

•  $y = -\frac{1}{2}x+7$   $, AC -$   $,$   $:$

- y -

BC

,

$\Delta ABC$  .

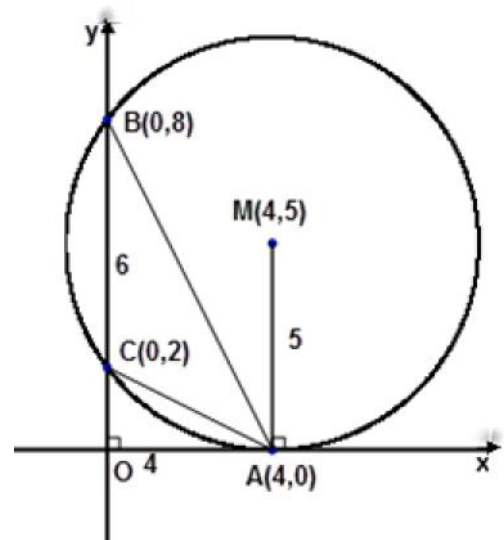
$O(0,0)$

, OA x -

$$S_{\Delta ABC} = \frac{BC \cdot OA}{2}$$

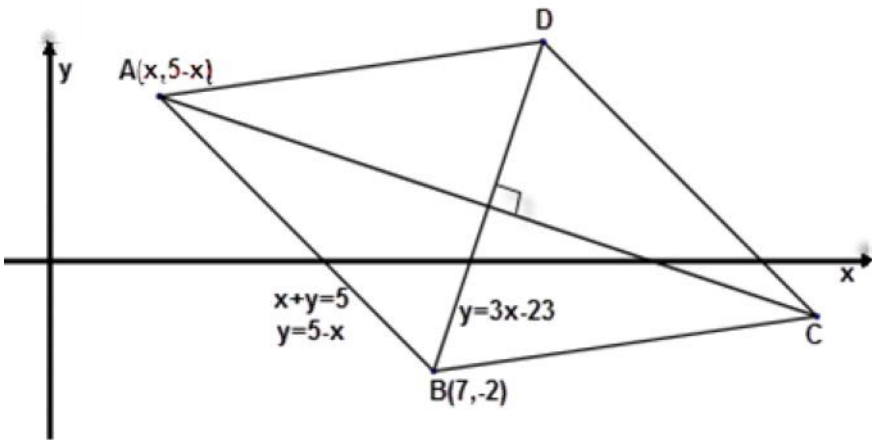
$$\left. \begin{array}{l} BC = y_B - y_C = 8 - 2 = 6 \\ OA = x_A - x_O = 4 - 0 = 4 \end{array} \right\} S_{\Delta ABC} = \frac{6 \cdot 4}{2} = 12$$

. " 12 ABC :



. B

.  $A(x, 5-x)$  ,  $(y=5-x)$  AB



.  $y = 3x - 23$  BD

.  $y = 5 - x$  ,  $x + y = 5$  AB

, BD  $y = 5 - x$

$5 - x = 3x - 23 \quad / -3x + 23$

$-4x = -28 \quad / :(-4)$

$x = 7 \rightarrow y = 5 - 7 = -2 \rightarrow \boxed{B(7, -2)}$

.  $B(7, -2)$  :

.  $\sqrt{50}$

, A

$AB = \sqrt{50}$

$\sqrt{(x-7)^2 + (5-x-(-2))^2} = \sqrt{50} \quad / ( )^2$

$(x-7)^2 + (7-x)^2 = 50$

$(x-7)(x-7) + (7-x)(7-x) = 50$

$x^2 - 7x - 7x + 49 + 49 - 7x - 7x + x^2 = 50$

$2x^2 - 28x + 98 = 50 \quad / -50$

$2x^2 - 28x + 48 = 0$

$x_{1,2} = \frac{-(-28) \pm \sqrt{(-28)^2 - 4 \cdot 2 \cdot 48}}{2 \cdot 2}$

$x_{1,2} = \frac{28 \pm 20}{4}$

$x_1 = \frac{28 + 20}{4} = \frac{48}{4} = 12$

$x_2 = \frac{28 - 20}{4} = \frac{8}{4} = 2 \quad o.k. \leftarrow x_A < 10$

$y_A = 5 - 2 = 3 \rightarrow \boxed{A(2, 3)}$

.  $A(2, 3)$  :

$$m_{BD} = 3$$

$$m_{AC} \cdot m_{BD} = -1 \rightarrow m_{AC} \cdot 3 = -1 \rightarrow m_{AC} = -\frac{1}{3} \quad \text{BD}$$

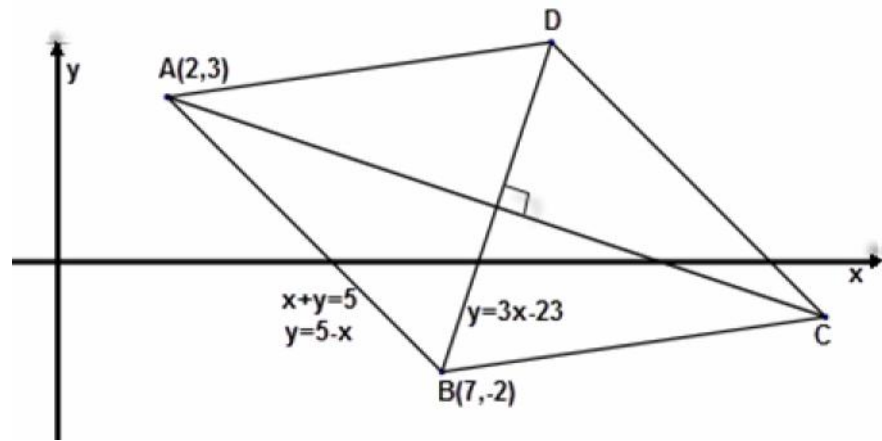
$$A(2,3), m_{AC} = -\frac{1}{3} \quad \text{AC}$$

$$y - 3 = -\frac{1}{3}(x - 2)$$

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

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

$$y = -\frac{1}{3}x + 3\frac{2}{3} \quad \text{AC} \quad :$$



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

$x \geq 0$  :

$x \geq 0$  :

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

$$0 = \frac{2}{2\sqrt{x}} - 1 \quad / \cdot 2\sqrt{x}$$

$$0 = 2 - 2\sqrt{x}$$

$$2\sqrt{x} = 2 \quad / : 2$$

$$\sqrt{x} = 1$$

$$x = 1 \rightarrow f(1) = 2 \cdot \sqrt{1} - 1 = 1 \rightarrow (1, 1)$$

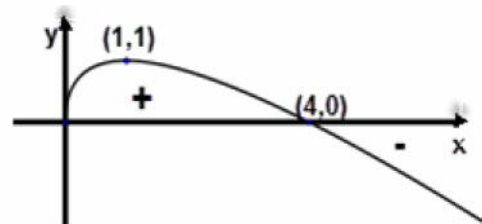
$$f'(0.5) = \frac{2}{2\sqrt{0.5}} - 1 > 0, \quad f'(2) = \frac{2}{2\sqrt{2}} - 1 < 0$$

0	0.5	1	2	$x$
	+	0	-	$f'(x)$
	↗	<b>Max</b>	↘	

$(1, 1)$  :

$x > 1$  ,  $0 < x < 1$  :

$(4, 0)$



$x$  -

$x > 4$  :

$0 < x < 4$  :

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•  $f(x) = x^3 + x^2 - x$

, B - A

x -

$$\boxed{f'(x) = 3x^2 + 2x - 1}$$

$$0 = 3x^2 + 2x - 1$$

$$x_{1,2} = \frac{-2 \pm \sqrt{2^2 - 4 \cdot 3 \cdot (-1)}}{2 \cdot 3}$$

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

$$x_1 = \frac{-2 + 4}{6} = \frac{2}{6} = \frac{1}{3} = x_B$$

$$x_2 = \frac{-2 - 4}{6} = \frac{-6}{6} = -1 = x_A$$

•  $x_B = \frac{1}{3}$ ,  $x_A = -1$  :

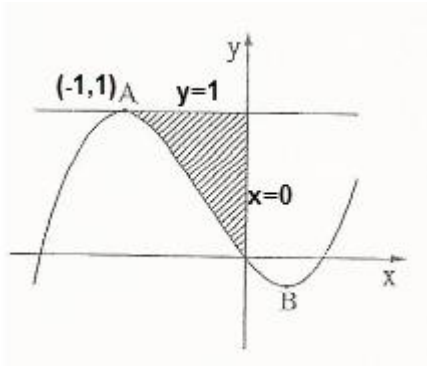
•  $f(x) = x^3 + x^2 - x$        $x = -1$       **(1)**

•  $y_A = (-1)^3 + (-1)^2 - (-1) = 1$

•  $y_A = 1$  :

A(-1, 1)      **(2)**

•  $y = 1$  :



$$S = \int_{-1}^0 (1 - (x^3 + x^2 - x)) dx$$

$$S = \int_{-1}^0 (1 - x^3 - x^2 + x) dx$$

$$S = x - \frac{x^4}{4} - \frac{x^3}{3} + \frac{x^2}{2} \Big|_{-1}^0$$

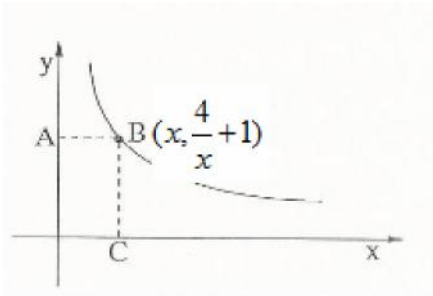
$$S = \left(0 - \frac{0^4}{4} - \frac{0^3}{3} + \frac{0^2}{2}\right) - \left(-1 - \frac{(-1)^4}{4} - \frac{(-1)^3}{3} + \frac{(-1)^2}{2}\right)$$

$$S = 0 - \left(-\frac{5}{12}\right)$$

$$\boxed{S = \frac{5}{12}}$$

• "  $\frac{5}{12}$  :

"



$B(x, \frac{4}{x} + 1)$

$f(x) = \frac{4}{x} + 1$

$AB = x_B - x_A = x - 0 = x$

$BC = y_B - y_C = \frac{4}{x} + 1 - 0 = \frac{4}{x} + 1$

$AB + BC = x + \frac{4}{x} + 1$

$AB + BC = x + \frac{4}{x} + 1$  **מינימום סכום האורכים**

$g(x) = x + \frac{4}{x} + 1$

$g'(x) = 1 - \frac{4}{x^2} \rightarrow g'(x) = \frac{x^2 - 4}{x^2}$

$0 = \frac{x^2 - 4}{x^2}$

$0 = x^2 - 4$

$4 = x^2$

$x = 2 \leftarrow x > 0$

$g'(1) = \frac{1^2 - 4}{+} < 0, \quad g'(3) = \frac{3^2 - 4}{+} > 0$

0	1	2	3	x
	-	0	+	$g'(x)$
	↘	<b>Min</b>	↗	

$AB + BC$  ,  $x_B = 2$  :