

.C - A - (") x - .
 .B - A - 1.5x
 (t) (v) (s) - s = vt

(.) :

s - "	v - "	t -		
(1) 60	(2) 1.5x	(3) $\frac{60}{1.5x} = \frac{40}{x}$	A - B -	
(6) 40	(5) x	(4) $\frac{40}{x}$	A - 40% C -	

. (" s -) C - A - 40% " 40
 .0.4s = 40 → s = " 100

. " 100 C A - :

.B C
 .x " 100 , $\frac{100}{x}$

. $x = 60 - \frac{60}{x} = 1 - \frac{100}{x} = \frac{40}{x} + 1$:

. " 60 :

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17

• $\sphericalangle ABM = \sphericalangle ACM = 90^\circ$, , (1) .

• (") ,

$$m_{MB} = \frac{1+4}{-2-3} = -1 \rightarrow m_{AB} = 1$$

$$y-1 = 1(x+2)$$

$$\boxed{y = x+3}$$

$$m_{MC} = \frac{-5+4}{3-10} = -\frac{1}{7} \rightarrow m_{AC} = 7$$

$$y+5 = 7(x-10)$$

$$\boxed{y = 7x-75}$$

• $y = x+3$ AB , $y = 7x-75$ AB :

• A (2)

$$\begin{cases} y = 7x-75 \\ y = x+3 \end{cases}$$

$$7x-75 = x+3$$

$$6x = 78$$

$$x = 13 \rightarrow y = 16 \rightarrow \boxed{A(13,16)}$$

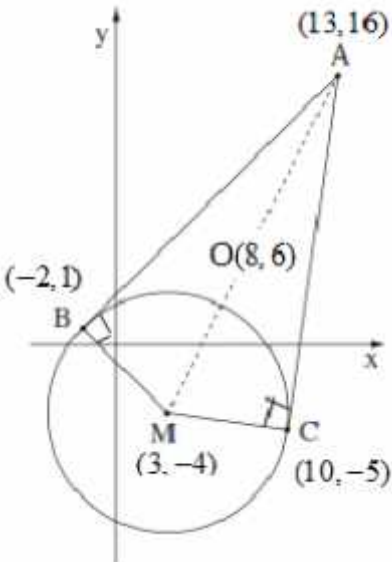
• A(13,16) :

• AM (1) .

$$d_{AM} = \sqrt{(16+4)^2 + (13-3)^2} = \sqrt{500} = 10\sqrt{5} = 22.36$$

• $10\sqrt{5} = 22.36$ AM :

$$\left. \begin{aligned} x_M &= \frac{-8+0}{2} = \frac{-8}{2} = -4 \\ y_M &= \frac{0+(-4)}{2} = \frac{-4}{2} = -2 \end{aligned} \right\} M(-4,-2)$$



• , AM

• ΔABM (2)

$$\left. \begin{aligned} x_O &= \frac{13+3}{2} = \frac{16}{2} = 8 \\ y_O &= \frac{16+(-4)}{2} = \frac{12}{2} = 6 \end{aligned} \right\} O(8,6)$$

• O(8,6)

• $R = \frac{10\sqrt{5}}{2} = 5\sqrt{5}$:

• $(x-8)^2 + (y-6)^2 = (5\sqrt{5})^2 = 125$:

• $(x-8)^2 + (y-6)^2 = 125$:

"

, $\triangle ACM$ -

AM

,
.(2)

-

,

C

.

C(10, -5)

:

$$(10-8)^2 + (-5-6)^2 = 125$$

$$125 = 125$$

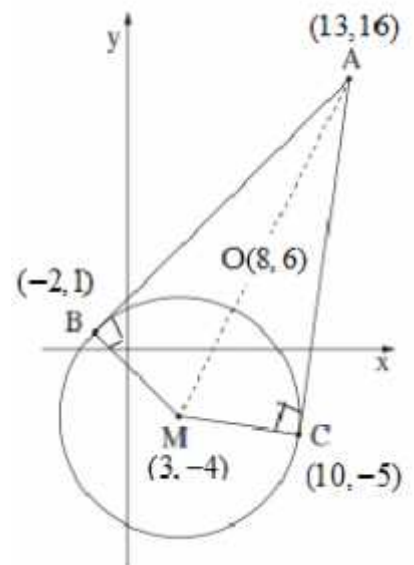
.

C

.

C

:



$$P(5 \text{ nekudot}) = \frac{1}{6}, \quad 5, 3$$

$$P(10 \text{ nekudot}) = \frac{3}{6} = \frac{1}{2}, \quad 10, (4,5,6), 3 -$$

$$P(0 \text{ nekudot}) = \frac{2}{6} = \frac{1}{3}, \quad (1,2), 3 -$$

: , 15

$$P = \frac{1}{6} \cdot \frac{1}{2} = \frac{1}{12} : \quad 10 - \quad 5$$

$$P = \frac{1}{2} \cdot \frac{1}{6} = \frac{1}{12} : \quad 5 - \quad 10$$

$$P = \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4} : \quad 10$$

$$P = \frac{1}{12} + \frac{1}{12} + \frac{1}{4} = \frac{5}{12} : \quad 15, \quad ,$$

$$\frac{5}{12} \quad 15 : \quad ,$$

15

.3 -

$$P(\text{no.} > 3 / \text{at least 15 points}) = \frac{P(\text{no.} > 3 \cap \text{at least 15 points})}{P(\text{at least 15 points})} = \frac{\frac{1}{4}}{\frac{5}{12}} = \frac{3}{5}$$

$$\frac{3}{5} : \quad ,$$

$$k = 2, p = \frac{5}{12}, n = 4,$$

$$P_n(k) = \binom{n}{k} (p)^k (1-p)^{n-k}$$

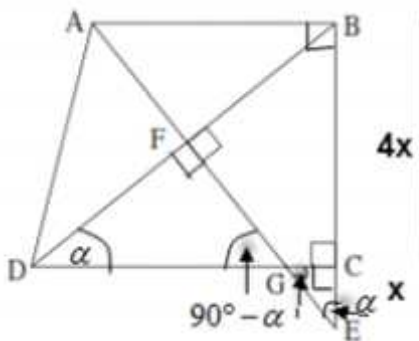
$$P_4(2) = \binom{4}{2} \left(\frac{5}{12}\right)^2 \left(1 - \frac{5}{12}\right)^{4-2}$$

$$P_4(2) = \frac{4!}{4!(4-2)!} \cdot \left(\frac{5}{12}\right)^2 \cdot \left(\frac{7}{12}\right)^2$$

$$P_4(2) = 6 \cdot \left(\frac{5}{12}\right)^2 \cdot \left(\frac{7}{12}\right)^2$$

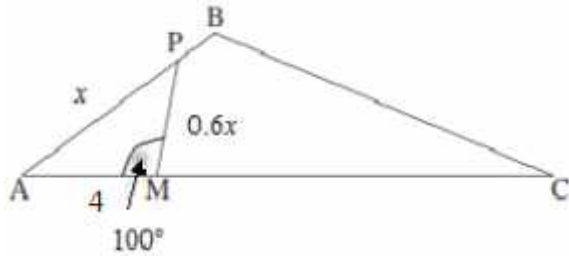
$$P_4(2) = \frac{1225}{3456} = 0.3545$$

$$\frac{1225}{3456} = 0.3545 :$$



$\angle BCD = 90^\circ$.3 $AB \parallel DC$.2 ABCD .1
 $CB = 4CE$.6 . $DC = BE$.5 : $AE \perp BD$.4
 $\angle AEB = \angle BDC$. : "
 $\triangle DCB \cong \triangle EBA$
 $\frac{GC}{AB}$ (2) $\triangle GCE \sim \triangle ABE$ (1) .

	$\angle AEB = r$	7	
	$\angle BCD = 90^\circ$	8	3
$180^\circ -$	$\angle ECG = 90^\circ$	9	8,7
,	$\angle ABC = \angle ADC = 90^\circ$	10	9
$\triangle GCE - 180^\circ$	$\angle CGE = 90^\circ - r$	11	10,7
	$\angle FGD = 90^\circ - r$	12	11
	$AE \perp BD$	13	4
$\triangle GDF - 180^\circ$	$\angle BDC = r$	14	13,12
	() $\angle AEB = \angle BDC$	15	14,7
. . .			
	() $DC = BE$	16	5
	$AB \parallel DC$	17	2
$180^\circ -$	$\angle EBA = 90^\circ$	18	17,8
	() $\angle EBA = \angle BCD$	19	18,8
	$\triangle DCB \cong \triangle EBA$	20	19,15,16
. . .			
1	$\frac{GC}{AB} = \frac{CE}{CB} = \frac{EG}{EA}$	21	17
	$\triangle GCE \sim \triangle ABE$	22	21
(1) . . .			
	$CB = 4CE$	23	6
	$\frac{GC}{AB} = \frac{1}{5}$	24	23,21
(2) . . .			



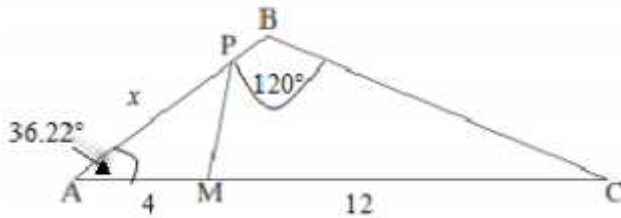
($\angle AMP = 100^\circ$)

$$\frac{\sin \angle PAM}{MP} = \frac{\sin 100^\circ}{AP}$$

$$\frac{\sin \angle PAM}{0.6x} = \frac{\sin 100^\circ}{x}$$

$$\boxed{\angle PAM = 36.22^\circ}$$

$\angle PAM = 36.22^\circ$:



BC (2)

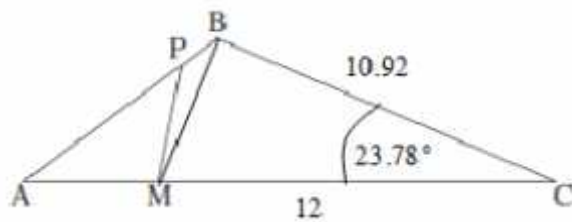
$$\frac{BC}{\sin 36.22^\circ} = \frac{AC}{\sin 120^\circ}$$

$$BC = \frac{16 \sin 36.22^\circ}{\sin 120^\circ}$$

$$\boxed{BC = 10.92}$$

BC = 10.92 :

$\angle C = 180^\circ - 120^\circ - 36.22^\circ = 23.78^\circ$



$$(BM)^2 = (BC)^2 + (MC)^2 - 2 \cdot BC \cdot MC \cdot \cos \angle C$$

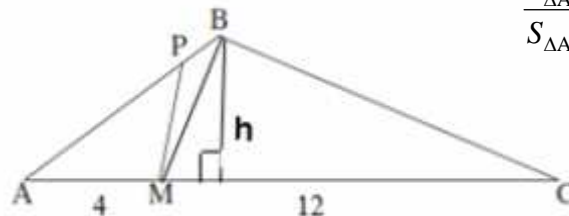
$$(BM)^2 = 10.92^2 + 12^2 - 2 \cdot 10.92 \cdot 12 \cdot \cos 23.78^\circ$$

$$(BM)^2 = 23.42$$

$$\boxed{BM = 4.839 \text{ cm}}$$

BM = 4.839 :

1:3



$$\frac{S_{\triangle AMB}}{S_{\triangle BMC}} = \frac{0.5 \cdot AM \cdot h}{0.5 \cdot MC \cdot h} = \frac{AM}{MC} = \frac{4}{12} = \frac{1}{3}$$

$$\frac{S_{\triangle AMB}}{S_{\triangle BMC}} = \frac{1}{3} :$$

$a > 0, f(x) = \frac{2x^2 + 4}{x^2 - a}$

$a > 0, x^2 - a \neq 0 \rightarrow x \neq \pm\sqrt{a}$ (1)

$x \neq \pm\sqrt{a} :$

(2)

$f(0) = \frac{2 \cdot 0^2 + 4}{0^2 - a} = \frac{4}{-a} = -\frac{4}{a} \rightarrow \left(0, -\frac{4}{a}\right)$ - $x = 0 : y$

$x -$

$, x$

$y = 0 : x$

$\left(0, -\frac{4}{a}\right) :$

(3)

(2) (2) $y = \frac{2x^2}{x^2} = 2 : x -$

$y = 2 :$

() $x = 1 ,$

$x = 1 .$

$a = 1 \quad 1^2 - a = 0$

$a = 1 :$

$f(x) = \frac{2x^2 + 4}{x^2 - 1} \quad a = 1 .$

$x = -1$ ()

$x = -1 \quad x \neq \pm 1$ (1)

$x = -1 , :$

(2)

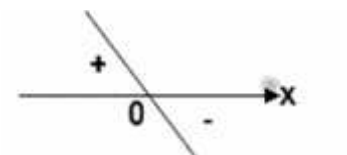
$$f'(x) = \frac{4x(x^2 - 1) - 2x(2x^2 + 4)}{(x^2 - 1)^2}$$

$$f'(x) = \frac{4x^3 - 4x - 4x^3 - 8x}{(x^2 - 1)^2}$$

$$f'(x) = \frac{-12x}{(x^2 - 1)^2}$$

$$-12x = 0 \rightarrow x = 0 \rightarrow (0, -4)$$

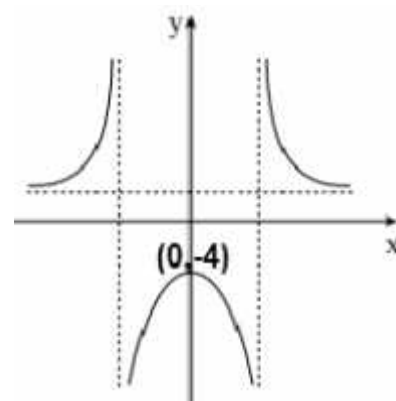
.() 0 - ,



	-1		0		1		x
+		+	0	-		-	y'
↖		↖	Max	↘		↘	

(0, -4) :

.0 < x < 1 x > 1 : , x < -1 -1 < x < 0 : : (3)



y = k ,

,(y = 2)

(0, -4)

-4 < k < 2 :

$$f(x) = \frac{4}{\sqrt{x+16}}$$

(1)

$$x+16 > 0 \rightarrow x > -16$$

$$x > -16 :$$

(2)

$$f(0) = \frac{4}{\sqrt{0+16}} = \frac{4}{4} = 1 \rightarrow (0,1)$$

$$- y = 0 : x$$

$$(0,1) :$$

$$x = -16 \quad (\quad) \quad x = -16$$

(4)

$$f'(x) = \frac{0 - \frac{4}{2\sqrt{x+16}}}{(\sqrt{x+16})^2}$$

$$f'(x) = \frac{-2}{\sqrt{x+16}(x+16)}$$

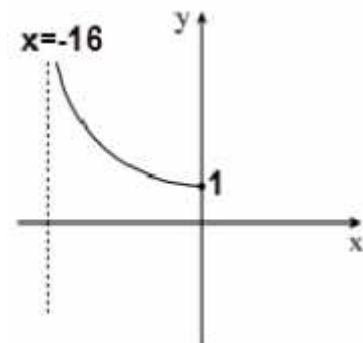
$$f'(x) = \frac{-2}{(x+16)\sqrt{x+16}}$$

$$(0,1) \quad x > -16$$

$$x > -16 :$$

$$-16 < x \leq 0$$

(5)



$$g(x) = f(x) - 2$$

$$g(x) = \frac{4}{\sqrt{x+16}} - 2$$

$$g(0) = f(0) - 2 = 1 - 2 = -1 \rightarrow \boxed{(0, -1)} \quad x = 0 : y \quad (1)$$

$$x = -16 \quad y = 0 : x$$

$$0 = \frac{4}{\sqrt{x+16}} - 2$$

$$2 = \frac{4}{\sqrt{x+16}}$$

$$\sqrt{x+16} = 2 \quad ()^2$$

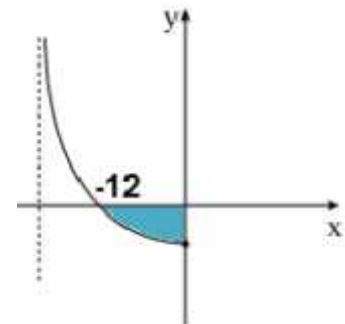
$$x+16 = 4$$

$$x = -12 \quad \text{test: } \sqrt{-12+16} = 2 \rightarrow 2 = 2 \text{ o.k.}$$

$$\boxed{(-12, 0)}$$

$$(-12, 0), (0, -1) :$$

$$-16 < x \leq 0 \quad g(x) = f(x) - 2 \quad (2)$$



$$S = \int_{-12}^0 (0 - (\frac{4}{\sqrt{x+16}} - 2)) dx$$

$$S = \int_{-12}^0 (-\frac{4}{\sqrt{x+16}} + 2) dx$$

$$S = -4 \cdot 2\sqrt{x+16} + 2x \Big|_{-12}^0$$

$$x = 0: -8\sqrt{0+16} + 2 \cdot 0 = -32$$

$$x = -12: -8\sqrt{-12+16} + 2 \cdot (-12) = -40$$

$$S = -32 - (-40)$$

$$\boxed{S = 8}$$

" 8 :

$$\cdot AE = x \cdot$$

$$BE = 6 - x, AE + BE = 6 :$$

$\cdot \Delta AEB -$

AB

$$(AE)^2 = x^2 + (6-x)^2$$

$$(AE)^2 = x^2 + 36 - 12x + x^2$$

$$(AE)^2 = 2x^2 + 36 - 12x$$

$$(AE) = \sqrt{2x^2 + 36 - 12x}$$

ΔABC

$$S_{\Delta ABC} = \frac{AB \cdot BC}{2} = \frac{AB \cdot AB}{2} = \frac{1}{2}(AB)^2$$

$$S_{\Delta ABC} = \frac{1}{2}(2x^2 + 36 - 12x)$$

$$\boxed{S_{\Delta ABC} = x^2 - 6x + 18}$$

$$\cdot S_{\Delta ABC} = x^2 - 6x + 18 :$$

$\cdot AEBC$ **שטח המרובע** **נקסיונות**

$$S_{AEBC} = S_{\Delta ABC} + S_{\Delta AEB}$$

$$S_{AEBC} = x^2 - 6x + 18 + \frac{x(6-x)}{2}$$

$$S_{AEBC} = x^2 - 6x + 18 + 3x - 0.5x^2$$

$$\boxed{S_{AEBC} = 0.5x^2 - 3x + 18}$$

$$\boxed{(S_{AEBC})' = x - 3}$$

$$x - 3 = 0$$

$$x = 3$$

$$(S_{AEBC})'' = 1 > 0 \rightarrow Min$$

$\cdot AEBC$, $x = 3 :$