

	( " )	( )		
1	$\frac{1}{m}$	$m$	,	
1	$\frac{1}{2m}$	$2m$	,	
$\frac{4}{m}$	$\frac{1}{m}$	4	,	4
$\frac{4}{2m} = \frac{2}{m}$	$\frac{1}{2m}$	4	,	
$\frac{4}{m}$	$\frac{1}{m}$	4	,	
$\frac{2}{2m} = \frac{1}{m}$	$\frac{1}{2m}$	2	,	

$\frac{4}{m} + \frac{2}{m} < 1$  ,  $4 -$  ,  
 $\frac{4}{m} + \frac{1}{m} > \frac{1}{2}$  ,  $\frac{1}{2} -$

$$\left\{ \begin{array}{l} \frac{4}{m} + \frac{2}{m} < 1 \rightarrow \frac{6}{m} < 1 \rightarrow m > 6 \\ \frac{4}{m} + \frac{1}{m} > \frac{1}{2} \rightarrow \frac{5}{m} > \frac{1}{2} \rightarrow m < 10 \\ m > 0 \end{array} \right\} \boxed{6 < m < 10}$$

$6 < m < 10$   $m$  :

, ' 3.5 - , .

2.5 , .

	( " )	( )		
$\frac{3.5}{m}$	$\frac{1}{m}$	3.5	,	
$\frac{1}{2m}$	$\frac{1}{2m}$	1	,	
$\frac{2.5}{2m}$	$\frac{1}{2m}$	2.5	,	

$$\frac{3.5}{m} - \frac{1}{2m} + \frac{2.5}{2m} = \frac{1}{2} \quad / \cdot 2m$$

$$7 - 1 + 2.5 = m$$

$$\boxed{m = 8.5}$$

$$. 6 < m < 10 : m$$

$$m = 8.5$$

$$m = 8.5 :$$

$$a_1 = -1, \quad a_{n+1} = \frac{a_n}{4a_n + 3} \quad ; \quad a_n$$

$$b_n = \frac{1}{a_n} + 2 = \frac{1 + 2a_n}{a_n} \quad b_n$$

$$b_{n+1} = \frac{1 + 2a_{n+1}}{a_{n+1}} = \frac{1 + 2 \cdot \frac{a_n}{4a_n + 3}}{\frac{a_n}{4a_n + 3}} = \frac{4a_n + 3 + 2a_n}{4a_n + 3} = \frac{6a_n + 3}{4a_n + 3}$$

$$\frac{b_{n+1}}{b_n} = \frac{\frac{6a_n + 3}{4a_n + 3}}{\frac{1 + 2a_n}{a_n}} = \frac{3(2a_n + 1)}{1 + 2a_n} = 3$$

$$(n - 1) \cdot 3 = b_n - b_1$$

$$b_1 = \frac{1}{a_1} + 2 = \frac{1}{-1} + 2 = 1$$

$$\frac{1}{a_1} + \frac{1}{a_2} + \dots + \frac{1}{a_n} \quad ;$$

$$\frac{1}{a_1} + \frac{1}{a_2} + \dots + \frac{1}{a_n} = b_1 - 2 + b_2 - 2 + \dots + b_n - 2$$

$$\frac{1}{a_1} + \frac{1}{a_2} + \dots + \frac{1}{a_n} = b_1 + b_2 + \dots + b_n - 2n$$

$$\frac{1}{a_1} + \frac{1}{a_2} + \dots + \frac{1}{a_n} = \frac{1(3^n - 1)}{3 - 1} - 2n$$

$$\boxed{\frac{1}{a_1} + \frac{1}{a_2} + \dots + \frac{1}{a_n} = \frac{3^n - 1}{2} - 2n}$$

$$\frac{1}{a_1} + \frac{1}{a_2} + \dots + \frac{1}{a_n} = \frac{3^n - 1}{2} - 2n \quad ;$$

$$\frac{1}{a_1} - \frac{1}{a_2} + \frac{1}{a_3} - \frac{1}{a_4} + \dots + \frac{1}{a_{n-1}} - \frac{1}{a_n}$$

$$\frac{1}{a_{n-1}} - \frac{1}{a_n} = b_{n-1} - 2 - (b_n - 2) = b_{n-1} - b_n$$

	-	
$b_2 = b_1 q_b = 1 \cdot 3 = 3$	$b_1 = 1$	$A_1$
$q_b^2 = 9$	$q_b^2 = 9$	$Q$
$\frac{n}{2}$	$\frac{n}{2}$	$N$

$$\frac{1}{a_1} - \frac{1}{a_2} + \frac{1}{a_3} - \frac{1}{a_4} + \dots + \frac{1}{a_{n-1}} - \frac{1}{a_n} = \frac{1(9^{\frac{n}{2}} - 1)}{9 - 1} - \frac{3(9^{\frac{n}{2}} - 1)}{9 - 1} = \frac{-2(3^n - 1)}{8}$$

$$\frac{1}{a_1} - \frac{1}{a_2} + \frac{1}{a_3} - \frac{1}{a_4} + \dots + \frac{1}{a_{n-1}} - \frac{1}{a_n} = \frac{1 - 3^n}{4}$$

$$\frac{1}{a_1} - \frac{1}{a_2} + \frac{1}{a_3} - \frac{1}{a_4} + \dots + \frac{1}{a_{n-1}} - \frac{1}{a_n} = \frac{1 - 3^n}{4} :$$

- p .

$$\binom{5}{4} \cdot p^4 \cdot (1-p)^{5-4} = 3 \cdot p^5 \quad /: p^4 > 0$$

$$P_5(4) = 3P_5(5)$$

$$\binom{5}{4} \cdot p^4 \cdot (1-p)^{5-4} = 3 \cdot p^5 \quad /: p^4 > 0$$

$$\frac{5!}{4!(5-4)!} \cdot (1-p) = 3p$$

$$5(1-p) = 3p$$

$$5 - 5p = 3p$$

$$\boxed{p = 0.625}$$

. p = 0.625 :

. 5 , 4 , 3 - ,

$$P_5(3) + P_5(4) + P_5(5) = P_5(3) + 3P_5(5) + P_5(5)$$

$$\binom{5}{3} \cdot 0.625^3 \cdot (1-0.625)^{5-3} + 3 \cdot 0.625^5 + 0.625^5$$

$$\frac{5!}{3!(5-3)!} \cdot 0.625^3 \cdot 0.375^2 + 4 \cdot 0.625^5$$

$$10 \cdot 0.625^3 \cdot 0.375^2 + 4 \cdot 0.625^5 = 0.7428$$

. 0.7428 :

(1) .

. 4 , 3 -

$$P_4(3) + P_4(4) =$$

$$= \binom{4}{3} \cdot 0.625^3 \cdot (1-0.625)^{4-3} + 0.625^4 =$$

$$= 4 \cdot 0.625^3 \cdot 0.375 + 0.625^4 = 0.5188$$

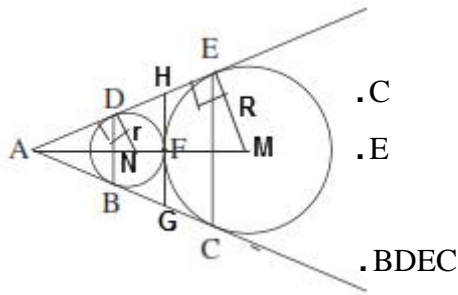
. 0.5188 , , :

(2)

. 4 , 3 -

. 4 4 , 3 --

. 0.5188 :



. F N M .1  
 AC .3 . B M AC .2  
 AE .5 . D M AE .4  
 N r .7 M R .6 :  
 GH . BDEC . : "  
 R · BD = r · CE .

	B	M	AC	8	2
	D	M	AE	9	4
		AD = AB		10	9,8
	C	N	AC	11	3
	E	N	AE	12	6
-		AE = AC		13	12,11
		$\frac{AD}{AE} = \frac{AB}{AC}$		14	13,10
1		DB    EC		15	14
A		DE // BC		16	
		BDEC		17	16,15
		DE = BC		18	13,10
		BDEC		19	18,17
. . .					
	F			20	1
		HE = HF HD = HF		21	20,12,9
		HD = HE		22	21
		GC = GF GB = GF		23	20,11,8
		GB = GC		24	23
	BDEC	. . GH		25	24,22,17
. . .					

	$ME \perp AE$	<b>26</b>	<b>12</b>
	$ND \perp AE$	<b>27</b>	<b>9</b>
-	$ND \parallel EM$	<b>28</b>	<b>14, 8</b>
<b>1</b>	$\frac{AD}{AE} = \frac{ND}{ME}$	<b>29</b>	<b>28</b>
<b>1</b>	$\frac{AD}{AE} = \frac{BD}{CE}$	<b>30</b>	<b>15</b>
	$\frac{BD}{CE} = \frac{ND}{ME}$	<b>31</b>	<b>30, 29</b>
	$ME \cdot BD = ND \cdot CE$	<b>32</b>	<b>31</b>
	$ND = r$ , $ME = R$	<b>33</b>	<b>7, 6</b>
	$R \cdot BD = r \cdot CE$	<b>34</b>	<b>33, 32</b>
. . .			

.( )  $\sphericalangle A = \sphericalangle D = r$  , (BC || AD) ABCD .  
 .(ΔABO) )  $\sphericalangle ABO = r$   
 .(180° ΔABO )  $\sphericalangle AOB = 180^\circ - 2r$   
 .( )  $\sphericalangle CBO = 180^\circ - 2r$   
 .( ) BT = TC ( ) OT ⊥ BC

ΔBTO

$$\cos(180^\circ - 2r) = \frac{BT}{OB}$$

$$-R \cos 2r = BT$$

$$\boxed{BC = -2R \cos 2r}$$

$$. BC = -2R \cos 2r :$$

BC ,  $\cos 2r < 0$  .

$$90^\circ < 2r < 180^\circ$$

$$45^\circ < r < 90^\circ$$

$$. 45^\circ < r < 90^\circ :$$

$$. S_{\Delta AED} = 9S_{\Delta COD} .$$

$$. 3:1$$

$$. AE = 3R - AE : OD = 3:1 :$$

.(ΔAED " (EO) E , AD OT

ΔAEO

$$\cos r = \frac{AO}{AE} = \frac{R}{3R} = \frac{1}{3}$$

$$\boxed{r = 70.53^\circ}$$

ΔAED

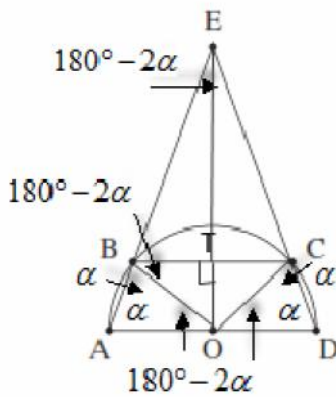
$$\frac{AE}{\sin 70.53^\circ} = 2R_{\Delta AED}$$

$$\frac{3R}{2 \sin 70.53^\circ} = R_{\Delta AED}$$

$$R_{\Delta AED} = 1.591R$$

$$\boxed{\frac{R_{\Delta AED}}{R} = 1.591}$$

$$. 1.591 :$$





$$a, b, f(x) = \frac{ax^2 + 4x}{x^2 + 3x + b}$$

$$x = 1, \quad x = 1$$

$$1^2 + 3 \cdot 1 + b = 0 \rightarrow b = -4$$

$$\lim_{x \rightarrow \infty} \frac{ax^2 + 4x}{x^2 + 3x - 4} = 1 \rightarrow \frac{ax^2}{x^2} = 1 \rightarrow a = 1, \quad y = 1$$

$$b = -4, a = 1 :$$

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

$$x = -4, \quad x = 1, x = -4$$

$$f(x) = \frac{x^2 + 4x}{x^2 + 3x - 4} = \frac{x(x+4)}{(x+4)(x-1)} = \frac{x}{x-1}, x \neq -4, 1$$

$$x \neq -4, 1 :$$

$$f(x) = \frac{x}{x-1}, x \neq -4, 1 \quad (2)$$

$$(0, 0) :$$

$$\lim_{x \rightarrow -4} \frac{x^2 + 4x}{x^2 + 3x - 4} = \lim_{x \rightarrow -4} \frac{x}{x-1} = \frac{-4}{-4-1} = 0.8 : ( \quad ) \quad x = -4 \quad (3)$$

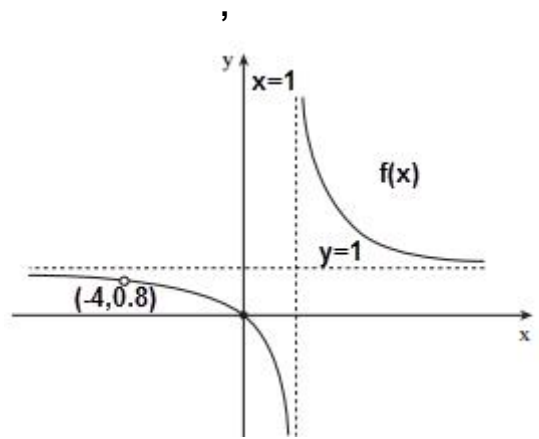
$$(-4, 0.8)$$

(4)

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

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

$$x < -4, \quad -4 < x < 1, \quad x > 1 : \quad x : :$$



$$|f(x)| = -f(x) \quad 0 \leq x < 1$$

$$-f(0) = -0 = 0 \quad |f(0)| = |0| = 0$$

$$f(x) \quad 0 < x < 1$$

$$f(x) \quad -f(x) \quad |f(x)|$$

$$0 \leq x < 1$$

$$g(x) = f^2(x) f'(x)$$

$$g(0) = f^2(0) \cdot f'(0) = 0 \cdot (-1) = 0$$

$$g(x) < 0 \quad f'(x) < 0 \quad f^2(x) > 0, \quad x \neq -4, 1$$

x -

$$\int_0^{0.5} (0 - g(x)) dx = \int_0^{0.5} (-f^2(x) f'(x)) dx = -\left[ \frac{f^3(x)}{3} \right]_0^{0.5} =$$

$$= -\frac{\left(\frac{0.5}{0.5-1}\right)^3}{3} - \left(-\frac{\left(\frac{0}{0-1}\right)^3}{3}\right) = -\left(-\frac{1}{3}\right) - 0 = \frac{1}{3}$$

:

.( - ) 0 -

$$a, f(x) = \frac{x}{\sqrt{x^2 - a^2}}$$

"

, f(x)

$$.x = \pm a$$

$$.x^2 - a^2 > 0$$

$$.x < -a \quad x > a :$$

.

f(x)

$$x = \pm a$$

.x

$$x = \pm a$$

$$\lim_{x \rightarrow \pm\infty} f(x) = \lim_{x \rightarrow \pm\infty} \frac{x}{|x|\sqrt{1 - \frac{a^2}{x^2}}} = \frac{x}{|x|} = \pm 1$$

$$y = 1,$$

$$( ) x \rightarrow +\infty$$

$$y = -1,$$

$$( ) x \rightarrow -\infty$$

$$.x = -a, x = a, (x \rightarrow +\infty)y = 1, (x \rightarrow -\infty)y = -1 :$$

:

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

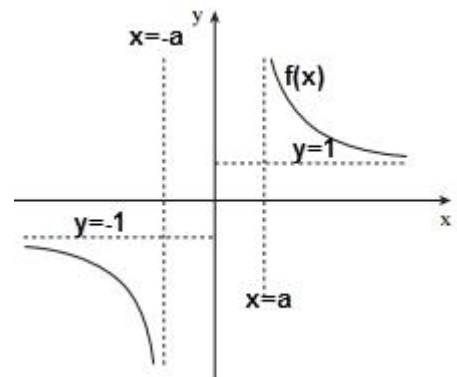
$$f'(x) = \frac{x^2 - a^2 - x^2}{(x^2 - a^2)\sqrt{x^2 - a^2}}$$

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

,

,

$$.x < -a \quad x > a : , x : :$$



"

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

$$- x = -a, x = a \quad (1)$$

$$- y = 0$$

$$. y = 0, x = -a, x = a :$$

(2)

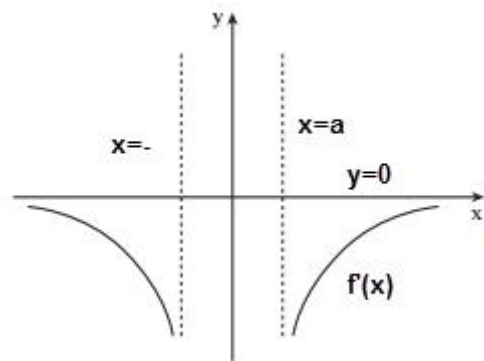
$$. f'(x) -$$

$$f(x)$$

$$. f'(x) \quad x > a \quad (\cup)$$

$$- f(x)$$

$$. f'(x) \quad x < -a \quad (\cap)$$



$$, f(-x) = \frac{-x}{\sqrt{(-x)^2 - a^2}} = -\frac{x}{\sqrt{x^2 - a^2}} = -f(x)$$

$$\int_{-3a}^{-2a} f(x) dx - \int_{2a}^{3a} f(x) dx$$

$$. 0$$

$$- x -$$

$$-$$

$$. 0$$

:

$$f(x) = \frac{x}{\sqrt{x^2}} = \frac{x}{|x|} \quad a=0$$

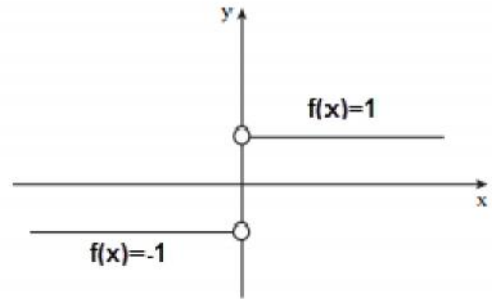
$$x \neq 0 \quad (1)$$

$$(\quad) x > 0 \quad (2)$$

$$(\quad) x < 0$$

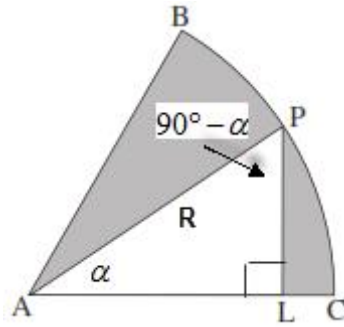
$$f(x) = 1 \quad ,$$

$$f(x) = -1 \quad ,$$



השטח האפור. מניחים

(1).



$$0 \leq r \leq \frac{f}{3}, \quad \angle PAC = r$$

$$S_{\Delta APL} = \frac{R^2 \sin r \sin(90^\circ - r)}{2 \sin 90^\circ}$$

$$S_{\Delta APL} = \frac{R^2 \sin r \cos r}{2}$$

$$S_{\Delta APL} = \frac{1}{4} R^2 \sin 2r$$

$$S_{\text{GRAY}} = \frac{1}{6} f R^2 - \frac{1}{4} R^2 \sin 2r$$

$\sin 2r$

$$r = \frac{f}{4}, \quad 2r = \frac{f}{2},$$

$$\angle PAC = \frac{f}{4} \therefore$$

$$\frac{1}{6} f R^2 - \frac{1}{4} R^2, \quad \angle PAC = \frac{f}{4}, \quad 24f - 36 \quad (2)$$

$$24f - 36 = \frac{1}{6} f R^2 - \frac{1}{4} R^2$$

$$12(24f - 36) = 2f R^2 - 3R^2$$

$$144(2f - 3) = R^2(2f - 3) \quad /: (2f - 3) \neq 0$$

$$\boxed{R=12} \quad \leftarrow R > 0$$

$R = 12 :$

APL

$$R = 12 \quad \angle PAC = \frac{f}{4}$$

$$S_{\Delta APL} = 36 \quad \text{APL} \quad :$$