

, q = 2 , a₄ = 40 :

. " 40 , 2

a₄ = a₁q³
40 = a₁ · 2³
a₁ = 5

. " 40 , " 20 , " 10 : . " 5

, q = 0.5 , S₄ = 3.75 :

.2 , () 2

S₄ = $\frac{a_1(q^4 - 1)}{q - 1}$
3.75 = $\frac{a_1(0.5^4 - 1)}{0.5 - 1}$
a₁ = 2

.(,) 2
.5 · 2 = " 10 , " 5

. 10 · 4 = " 40 ,
" 40 :

. 09:45 , ,
. 11:45

. 40 : 2 = " 20

. " 10 , () 10:00

. , " 5 , , 0.25 · 20 = " 5 10:00

. 10:00 - , " 5 -

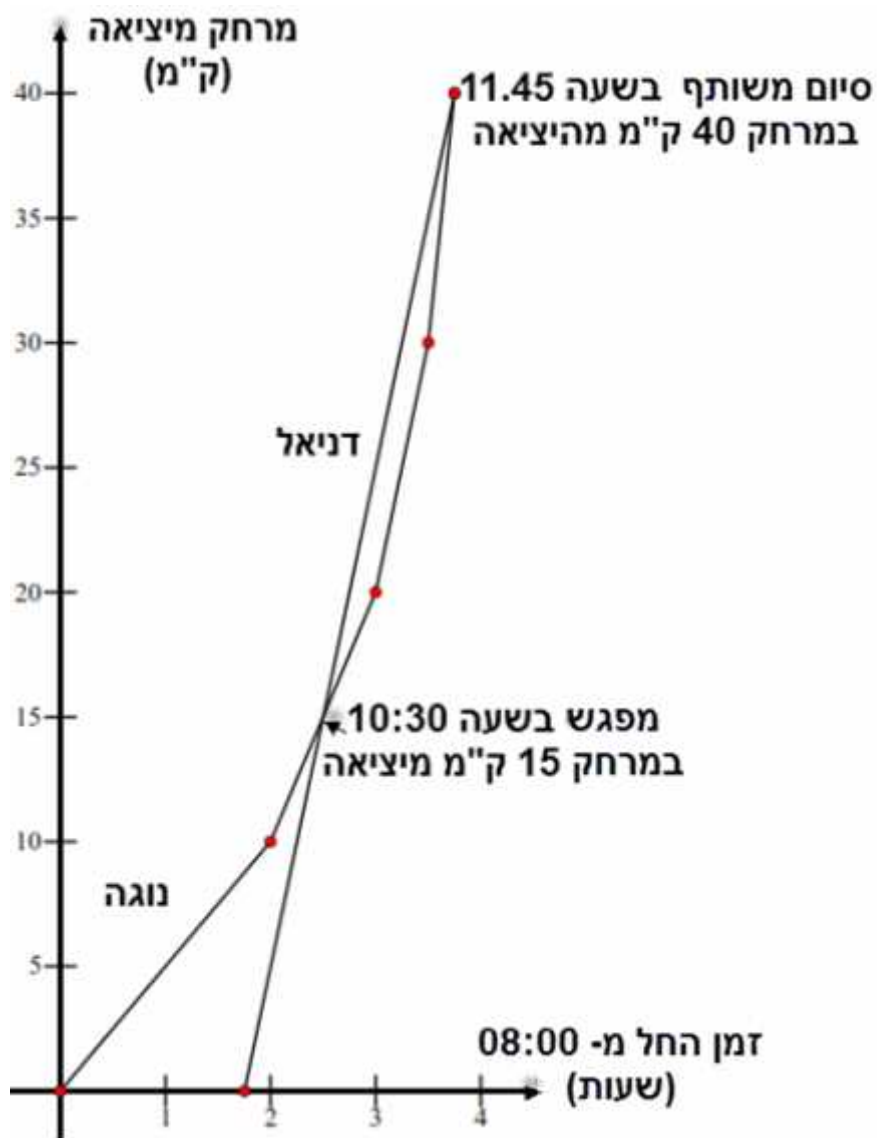
() t -

. " 10

. t = 0.5 ← 10t + 5 = 20t

. 10:30 , 10:00 , 0.5

. 10:30 , :



$$a_n = \frac{(2^n + 1)(2^n - 1)}{2^n} : a_n$$

$$(a + b)(a - b) = a^2 - b^2 :$$

$$a_n = \frac{(2^n + 1)(2^n - 1)}{2^n} = \frac{4^n - 1}{2^n} = 2^n - \frac{1}{2^n}$$

$$a_n = 2^n - \left(\frac{1}{2}\right)^n$$

$$a_n -$$

$$a_n = b_n - c_n : , c_n = \left(\frac{1}{2}\right)^n - b_n = 2^n :$$

$$c_n = \left(\frac{1}{2}\right)^n , \left(\frac{1}{2}\right)^3 = \frac{1}{8} , c_3 = \frac{1}{8} :$$

$$b_n = 2^n , 2^6 = 64 , b_6 = 64 :$$

$$2 \quad b_1 = 2 : (1)$$

$$\frac{1}{2} \quad c_1 = \frac{1}{2} : (2)$$

$$a_n = b_n - c_n$$

$$+ \begin{cases} a_1 = b_1 - c_1 \\ a_2 = b_2 - c_2 \\ a_3 = b_3 - c_3 \\ \dots \\ a_n = b_n - c_n \end{cases}$$

$$A_n = B_n - C_n$$

∴

$$.0.9 < B_n - A_n < 1 \quad n$$

$$.0.9 < C_n < 1 \quad , C_n = B_n - A_n$$

$$0.9 < C_n < 1$$

$$\Leftrightarrow 0.9 < \frac{c_1(q^n - 1)}{q - 1} < 1$$

$$\Leftrightarrow 0.9 < \frac{\frac{1}{2}((\frac{1}{2})^n - 1)}{\frac{1}{2} - 1} < 1$$

$$\Leftrightarrow 0.9 < \frac{\frac{1}{2}((\frac{1}{2})^n - 1)}{-\frac{1}{2}} < 1$$

$$\Leftrightarrow 0.9 < 1 - (\frac{1}{2})^n < 1$$

$$. \quad n \quad 0 < (\frac{1}{2})^n \quad , 1 - (\frac{1}{2})^n < 1 :$$

$$. (\frac{1}{2})^n < 0.1 \quad , 0.9 < 1 - (\frac{1}{2})^n :$$

$$.0.1 - \quad , \quad (\frac{1}{2})^n$$

$$. (\frac{1}{2})^4 = 0.0625 < 0.1 \quad , (\frac{1}{2})^3 = 0.125 > 0.1 \quad , (\frac{1}{2})^2 = 0.25 > 0.1 \quad , (\frac{1}{2})^1 = 0.5 > 0.1$$

$$. \quad n \geq 4 \quad :$$

$$\binom{9}{4} \cdot p^4 \cdot (1-p)^{9-4} = 24 \cdot \binom{9}{6} \cdot p^6 \cdot (1-p)^{9-6} \quad /: p^4(1-p)^3 > 0$$

$$P_9(4) = 24P_9(6)$$

$$\frac{9!}{4!(9-4)!} \cdot (1-p)^2 = 24 \cdot \frac{9!}{6!(9-6)!} p^2$$

$$126(1-p)^2 = 24 \cdot 84p^2$$

$$(1-p)^2 = 16p^2 \quad / \sqrt{\quad}$$

$$1-p = 4p$$

$$\boxed{p = 0.2}$$

(. p = 0.2 :

$$P(4 \text{ have kalnoit} / \text{at least 3 have kalnoit}) = \frac{P(4 \text{ have kalnoit} \cap \text{at least 3 have kalnoit})}{P(\text{at least 3 have kalnoit})} =$$

$$= \frac{P_6(4)}{P_6(3) + P_6(4) + P_6(5) + P_6(6)} = \frac{\binom{6}{4} \cdot 0.2^4 \cdot 0.8^2}{\binom{6}{3} \cdot 0.2^3 \cdot 0.8^3 + \binom{6}{4} \cdot 0.2^4 \cdot 0.8^2 + \binom{6}{5} \cdot 0.2^5 \cdot 0.8^1 + 0.2^6}$$

$$= \frac{15 \cdot 0.2^4 \cdot 0.8^2}{20 \cdot 0.2^3 \cdot 0.8^3 + 15 \cdot 0.2^4 \cdot 0.8^2 + 6 \cdot 0.2^5 \cdot 0.8^1 + 0.2^6} =$$

$$= \frac{48/3125}{309/3125} = \frac{16}{103}$$

$$\cdot \frac{16}{103} :$$

$$P = P_5(2) \cdot p$$

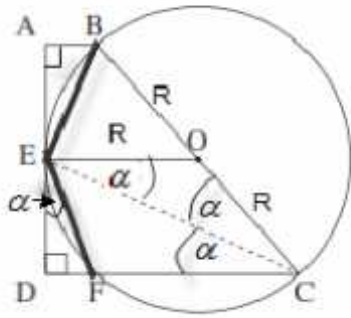
$$P = \binom{5}{2} \cdot 0.2^2 \cdot 0.8^3 \cdot 0.2$$

$$P = 10 \cdot 0.2^2 \cdot 0.8^3 \cdot 0.2$$

$$P = 0.04096$$

$$\cdot 0.04096 :$$

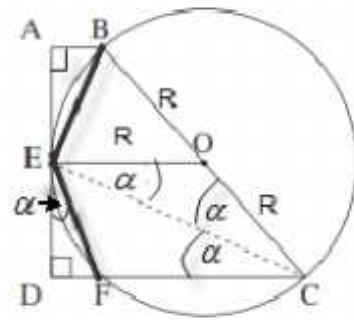
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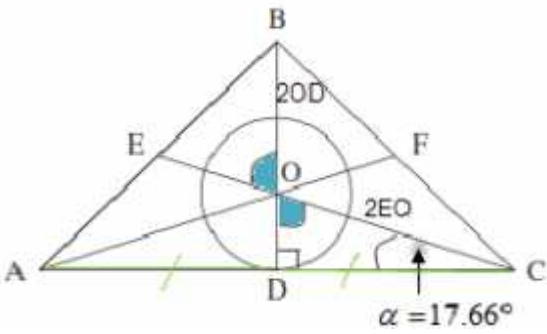


$\angle D = 90^\circ$.4 $AB \parallel DC$.3 . O .1
ABCD .2
 . BC .6 .E AD .5
 $BC = DF + DC$. $\triangle ABE \cong \triangle DFE$. $\angle BCD = 2\angle DEF$. : "

	$\angle DEF = r$	7	
	E AD	8	5
	$\angle ECF = \angle DEF = r$	9	8,7
	O	10	1
	E N AE	11	10,8
	$\angle OEA = 90^\circ$	12	11,10
	$\angle D = 90^\circ$	13	4
-	$EO \parallel DC$	14	13,12
	$\angle OEC = \angle ECF = r$	15	14,9
	$OE = OC$	16	10
"	$\angle OCE = \angle OEC = r$	17	16,15
	$\angle BCD = 2r$	18	17,9
	$\angle BCD = 2\angle DEF$	19	18,7
...			
	$OB = OC$	20	10
	ABCD	21	1
	$AB \parallel DC$	22	3
-	$EO \parallel AB$	23	22,14
	EO ABCD	24	23,21,20,14
	() $AE = ED$	25	24
	() $BE = EF$	26	17,9
$180^\circ -$	() $\angle A = \angle D = 90^\circ$	27	22,9
	$\triangle ABE \cong \triangle DFE$	28	27,26,25
...			

	$EO = \frac{AB + DC}{2}$	29	24
...	$DF = AB$	30	28
	$2EO = DF + DC$	31	30, 29
	BC	32	6
	$2EO = BC$	33	32
	$BC = DF + DC$	34	33, 31
...			





AC BD , ΔABC .
 . CO = 2OE - , BO = 2OD : , 2:1

.() ∠BOE = ∠COD

$$S_{\triangle BOE} = S_{\triangle COD}$$

$$\frac{1}{2} \cdot BO \cdot OE \cdot \sin \angle BOE = \frac{1}{2} \cdot CO \cdot OD \cdot \sin \angle COD$$

$$2OD \cdot \frac{CO}{2} \cdot \sin \angle COD = CO \cdot OD \cdot \sin \angle COD$$

$$CO \cdot OD = CO \cdot OD \quad \text{o.k}$$

.(ΔCOD - 180°) ∠COD = 90° - r , () ∠ACE = r .
 .D , O S_{ΔAOC} :

$$S_{\triangle COD} = \frac{(OD)^2 \cdot \sin \angle (90^\circ - r) \cdot \sin 90^\circ}{2 \sin r}$$

$$S_{\triangle COD} = \frac{(OD)^2 \cdot \cos r}{2 \sin r}$$

$$S_{\triangle COD} = \frac{(OD)^2}{2 \tan r}$$

. S_{ΔAOC} = $\frac{(OD)^2}{\tan r}$:

: S_{ΔAOC}

$$\frac{(OD)^2}{\tan r} = f \cdot (OD)^2 \quad /: (OD)^2 > 0$$

$$\frac{1}{f} = \tan r$$

$$r = 17.66^\circ \rightarrow \boxed{\angle ACE = 17.66^\circ} \quad (r < 90^\circ)$$

. ∠ACE = 17.66° :

. OD = r , OE .

ΔAEO

$$\sin 17.66^\circ = \frac{OD}{OC}$$

$$OC = \frac{r}{\sin 17.66^\circ}$$

$$OC = 1.3269r$$

$$OE = \frac{1.3269r}{2}$$

$$\boxed{OE = 1.6485r}$$

. OE = 1.6485r :

"

$$f(x) = \frac{x-5}{\sqrt{x^2-10x+24}}$$

$$f(x) \tag{1}$$

$$x = 4, 6$$

$$x < 4 \quad x > 6$$

$$x < 4 \quad x > 6 :$$

$$x = 5 \tag{2}$$

$$-1.021 \quad x = 0$$

$$(0, -1.021) : y$$

$$\tag{3}$$

$$:()$$

$$\left(\lim_{x \rightarrow 6^+} f(x) = +\infty\right) \quad x = 6 \quad .223 \quad x = 6.00001$$

$$\left(\lim_{x \rightarrow 4^-} f(x) = -\infty\right) \quad x = 4 \quad .-223 \quad x = 3.99999$$

$$.1.000055 \quad x = 100$$

$$y = 1$$

$$.-1.000045 \quad x = -100$$

$$y = -1$$

:

$$\lim_{x \rightarrow \infty} \frac{x-5}{\sqrt{x^2-10x+24}} = \lim_{x \rightarrow \infty} \frac{x-5}{|x|\sqrt{1-\frac{10}{x}+\frac{24}{x^2}}}$$

$$\lim_{x \rightarrow +\infty} \frac{x-5}{|x|\sqrt{1-\frac{10}{x}+\frac{24}{x^2}}} = \lim_{x \rightarrow +\infty} \frac{x-5}{x\sqrt{1-\frac{10}{x}+\frac{24}{x^2}}} = 1$$

$$\lim_{x \rightarrow -\infty} \frac{x-5}{|x|\sqrt{1-\frac{10}{x}+\frac{24}{x^2}}} = \lim_{x \rightarrow +\infty} \frac{x-5}{-x\sqrt{1-\frac{10}{x}+\frac{24}{x^2}}} = -1$$

$$(x \rightarrow -\infty) y = -1, (x \rightarrow +\infty) y = 1, x = 4, x = 6 :$$

(3)

$$f(x) = \frac{x-5}{\sqrt{x^2-10x+24}}$$

$$f'(x) = \frac{\sqrt{x^2-10x+24} - \frac{(x-5)(2x-10)}{2\sqrt{x^2-10x+24}}}{x^2-10x+24}$$

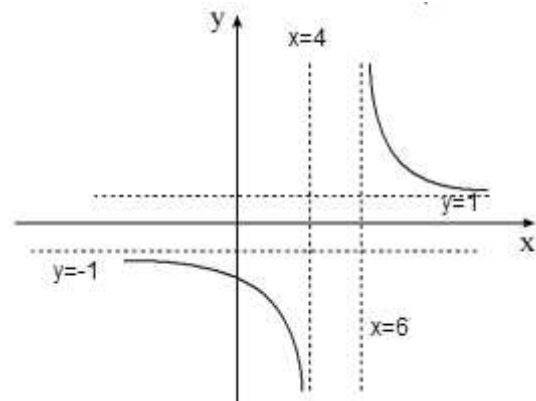
$$f'(x) = \frac{\sqrt{x^2-10x+24} - \frac{2(x-5)(x-5)}{2\sqrt{x^2-10x+24}}}{x^2-10x+24}$$

$$f'(x) = \frac{x^2-10x+24 - (x^2-10x+25)}{(x^2-10x+24)\sqrt{x^2-10x+24}}$$

$$f'(x) = \frac{-1}{\sqrt{(x^2-10x+24)^3}}$$

• ,
 ,
 • x : , x < 4 x > 6 : :

(5)



• f(x)

5

• , g(x) = f(x+5)

(1) •

$$g(x) = f(x+5)$$

$$g(x) = \frac{x+5-5}{\sqrt{(x+5)^2-10(x+5)+24}}$$

$$g(x) = \frac{x}{\sqrt{x^2+10x+25-10x-50+24}}$$

$$g(x) = \frac{x}{\sqrt{x^2-1}}$$

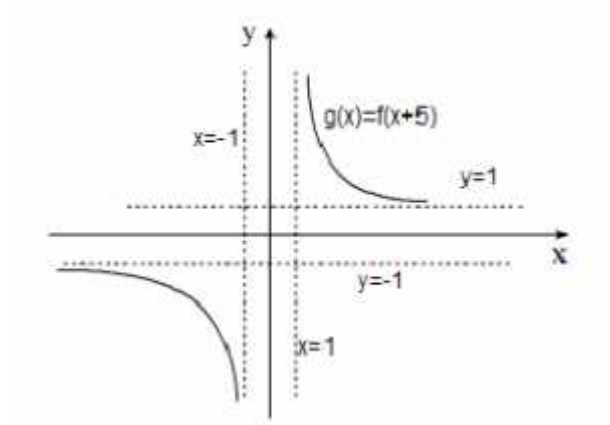
$$g(-x) = \frac{-x}{\sqrt{(-x)^2-1}} = -\frac{x}{\sqrt{x^2-1}} = -g(x)$$

• () -

g(x) = f(x+5)

• :

(2)



$$1 < a < b \quad , \int_a^b g(x) dx = \int_{a+5}^{b+5} f(x) dx \quad .$$

: , $1 < a < b$,
 . $g(x)$ $x > 1$ - , $f(x)$ $x > 6$
 , 5 ,
 . -
 . :

$$0 \leq x \leq \frac{f}{2}, \quad f(x) = \frac{2 \sin x}{\cos^3 x}$$

$$\cos^3 x \neq 0 \rightarrow \cos x \neq 0 \rightarrow \boxed{x \neq \frac{f}{2} + f k} \quad (1)$$

$$x \neq \frac{f}{2} + f k :$$

$$y = 0 \quad x - \quad (2)$$

$$0 = 2 \sin x$$

$$0 = \sin x$$

$$x = f k$$

$$\boxed{(f k, 0)}$$

$$\therefore y(0, 0) -$$

$$(f k, 0) : x -$$

:

$$x = \frac{f}{2} + f k$$

$$x = \frac{f}{2} + f k \quad (2)$$

$$x = \frac{f}{2} + f k :$$

(4)

$$f'(x) = 2 \cdot \frac{\cos^4 x + 3 \cdot \sin^2 x \cdot \cos^2 x}{\cos^6 x}$$

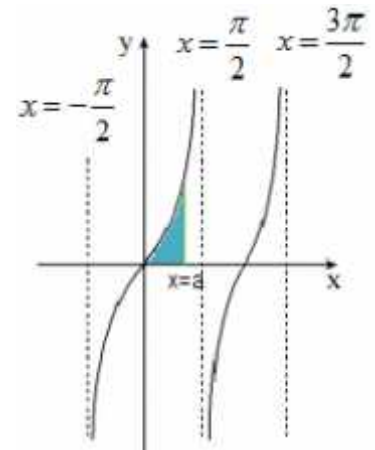
$$f'(x) = 2 \cdot \frac{\cos^2 x + 3 \cdot \sin^2 x}{\cos^4 x}$$

$$f'(x) = 2 \cdot \frac{\cos^2 x + \sin^2 x + 2 \cdot \sin^2 x}{\cos^4 x}$$

$$\boxed{f'(x) = 2 \cdot \frac{1 + 2 \cdot \sin^2 x}{\cos^4 x}}$$

$$\frac{f}{2} + f k < x < \frac{f}{2} + f(k+1) :$$

$$, -\frac{f}{2} < x < \frac{3f}{2}$$



, (1-)

$$S = \int_0^a \left(\frac{2 \sin x}{\cos^3 x} - 0 \right) dx$$

$$S = \int_0^a (-2(\cos x)^{-3}(-\sin x)) dx$$

$$S = \left(-2 \frac{(\cos x)^{-2}}{-2} \right) \Bigg|_0^a$$

$$S = \left(\frac{1}{\cos^2 x} \right) \Bigg|_0^a$$

$$S = \frac{1}{\cos^2 a} - \frac{1}{\cos^2 0}$$

$$S = \frac{1}{\cos^2 a} - 1$$

$$1 = \frac{1}{\cos^2 a} - 1$$

$$\cos^2 a = \frac{1}{2}$$

$$\cos a = \pm \frac{\sqrt{2}}{2}$$

$$\cos a = \frac{\sqrt{2}}{2} \quad \cos a = -\frac{\sqrt{2}}{2}$$

$$a = \pm \frac{f}{4} + 2fk \quad a = \pm \frac{3f}{4} + 2fk$$

$$\boxed{a = \frac{f}{4}} \quad \leftarrow 0 < a < a$$

$$. a = \frac{f}{4} :$$

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$$, f(x) = -x^2 + 2x + c$$

$$. x = -\frac{b}{2a} = -\frac{2}{-2} = 1 \rightarrow x = 1$$

$$. t = 2 - \quad 1 = \frac{2t + (-t)}{2} : x -$$

$$. c = 8 - \quad 0 = -4^2 + 2 \cdot 4 + c : \quad . (4, 0) \quad B$$

$$, c = 8, t = 2 :$$

$$. \frac{ML \cdot KL}{2}$$

, KLM *efien nge* *pin'isqen*

$$. K(x, -x^2 + 2x + 8)$$

$$. M - \quad L \quad - MK = |x - 1| \quad , \quad M(1, 0)$$

$$. KL = -x^2 + 2x + 8$$

$$. MK = x - 1 : \quad , x_L > x_M$$

$$S = \frac{(x-1) \cdot (-x^2 + 2x + 8)}{2}$$

$$S = \frac{1}{2} \cdot (-x^3 + 2x^2 + 8x + x^2 - 2x - 8)$$

$$S = \frac{1}{2} \cdot (-x^3 + 3x^2 + 6x - 8)$$

$$S' = \frac{1}{2} \cdot (-3x^2 + 6x + 6)$$

$$0 = -3x^2 + 6x + 6$$

$$x = 2.732 \text{ o.k. } (x > 1)$$

$$x = -0.732 \text{ not o.k. } (x < 1)$$

$$S'' = \frac{1}{2} \cdot (-6x + 6)$$

$$S''(2.732) < 0 \rightarrow \text{Max}$$

$$MK = 1 - x : \quad , x_L < x_M$$

$$S = -\frac{1}{2} \cdot (-x^3 + 3x^2 + 6x - 8)$$

$$S' = -\frac{1}{2} \cdot (-3x^2 + 6x + 6)$$

$$(x < 1) \quad x = -0.732$$

$$. x = -0.732, x = 2.732 ::$$