

$$P = \dots$$

$$(P:1)$$

$$P = \dots$$

$$\left(\frac{0.25}{4} = \frac{1}{16}\right) \quad 16$$

$$\left(P = \frac{S_1/t_1}{S_2/t_2} \rightarrow P = \frac{S_1 \cdot t_2}{S_2 \cdot t_1} \rightarrow P = \frac{1}{P} \cdot 16 \rightarrow P^2 = 16\right) \quad \sqrt{16} = 4$$

. 4 :

. " 90 - B - A .

, $\frac{1}{5}$, 4:1

. " 72 - " 90:5=18 -

. " 18 - ,

" 30 , " 120 ,

. " 120 - " 72 - :

. " 30 - " 18 -

$$a_1, a_2, a_3, \dots, a_n$$

$$n = 1 \tag{.1}$$

$$a_1^2 \cdot a_1^2 : (a_1 \cdot a_1)^2 = a_1^2 \cdot a_1^2 :$$

$$n = 1$$

$$(\quad) \quad n = k \tag{.2}$$

$$a_1^2 \cdot a_2^2 \cdot a_3^2 \cdot \dots \cdot a_k^2 = (a_1 \cdot a_k)^k :$$

$$n = k + 1 \tag{.3}$$

$$a_1^2 \cdot a_2^2 \cdot a_3^2 \cdot \dots \cdot a_k^2 \cdot a_{k+1}^2 = (a_1 \cdot a_{k+1})^{k+1} ,$$

$$\frac{a_1^2 \cdot a_2^2 \cdot a_3^2 \cdot \dots \cdot a_k^2 \cdot a_{k+1}^2}{\downarrow} = (a_1 \cdot a_{k+1})^{k+1}$$

$$\Leftrightarrow (a_1 \cdot a_k)^k \cdot a_{k+1} \cdot a_{k+1} = (a_1 \cdot a_{k+1})^{k+1}$$

$$\Leftrightarrow a_1 \cdot a_k^k \cdot a_{k+1} \cdot a_{k+1} = (a_1 \cdot a_{k+1})^{k+1}$$

$$\Leftrightarrow a_1 \cdot \left(\frac{a_{k+1}}{q}\right)^k \cdot a_{k+1} \cdot a_{k+1} = (a_1 \cdot a_{k+1})^{k+1}$$

$$\Leftrightarrow a_1^k \cdot \frac{a_{k+1}^k}{q^k} \cdot a_1 q^k \cdot a_{k+1} = (a_1 \cdot a_{k+1})^{k+1}$$

$$\Leftrightarrow (a_1 \cdot a_{k+1})^{k+1} = (a_1 \cdot a_{k+1})^{k+1}$$

$$n = k$$

$$n = 1$$

$$n$$

$$n = k + 1$$

$$\tag{.4}$$

$$a_1^2 \cdot a_2^2 \cdot a_3^2 \cdot \dots \cdot a_n^2 = (a_1 \cdot a_n)^n \quad "$$

$$\begin{aligned} \boxed{a_1^2 \cdot a_2^2 \cdot a_3^2 \cdot \dots \cdot a_n^2} &= (a_1 \cdot a_2 \cdot a_3 \cdot \dots \cdot a_n)^2 \\ &= (a_1 \cdot a_1 q \cdot a_1 q^2 \cdot \dots \cdot a_1^{n-1})^2 = (a_1^n \cdot q^{1+2+\dots+n-1})^2 = \\ &= (a_1^n \cdot q^{\frac{(n-1)(1+n-1)}{2}})^2 = a_1^{2n} \cdot q^{(n-1)n} = \\ &= (a_1^2 \cdot q^{n-1})^n = (a_1 \cdot a_1 \cdot q^{n-1})^n = \boxed{(a_1 \cdot a_n)^n} \end{aligned}$$

$$a_1^4 \cdot a_6^4 = 1,048,576 : \quad .$$

$$a_1 \cdot a_6 = \pm \sqrt[4]{1,048,576} = \pm 32 \quad (1)$$

: ,

$$a_1^2 \cdot a_2^2 \cdot a_3^2 \cdot \dots \cdot a_6^2 = (a_1 \cdot a_6)^6$$

$$a_1^2 \cdot a_2^2 \cdot a_3^2 \cdot \dots \cdot a_6^2 = (\pm 32)^6 = (\pm 2^5)^6$$

$$a_1^2 \cdot a_2^2 \cdot a_3^2 \cdot \dots \cdot a_6^2 = 2^{30}$$

$2^{30} :$

$$a_1 = 1 \quad (2)$$

$$a_1 \cdot a_6 = \pm 32$$

$$a_1 \cdot a_1 \cdot q^5 = \pm 32$$

$$1 \cdot 1 \cdot q^5 = \pm 32$$

$$q = \pm 2$$

: ,

$$a_1^2 \cdot a_2^2 \cdot a_3^2 \cdot \dots \cdot a_7^2 = (a_1 \cdot a_7)^7 = (1 \cdot a_7)^7 = a_7^7$$

$$a_1^2 \cdot a_2^2 \cdot a_3^2 \cdot \dots \cdot a_6^2 = (a_1 \cdot q^6)^7 = (1 \cdot q^6)^7 = ((\pm 2)^6)^7 = (2^6)^7$$

$$a_1^2 \cdot a_2^2 \cdot a_3^2 \cdot \dots \cdot a_7^2 = 2^{42}$$

$2^{42} :$

()

$$p = 0.1, n = 5$$

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

$$P_5(0) = \binom{5}{0} (0.1)^0 (1-0.1)^{5-0}$$

$$P_5(0) = 1 \cdot 1 \cdot 0.9^5$$

$$P_5(0) = 0.59049$$

$$P_5(1) = \binom{5}{1} (0.1)^1 (1-0.1)^{5-1}$$

$$P_5(1) = \frac{5!}{1!(5-1)!} \cdot 0.1^1 \cdot 0.9^4$$

$$P_5(1) = 5 \cdot 0.1^1 \cdot 0.9^4$$

$$P_5(1) = 0.32805$$

$$P_5(2) = \binom{5}{2} (0.1)^2 (1-0.1)^{5-2}$$

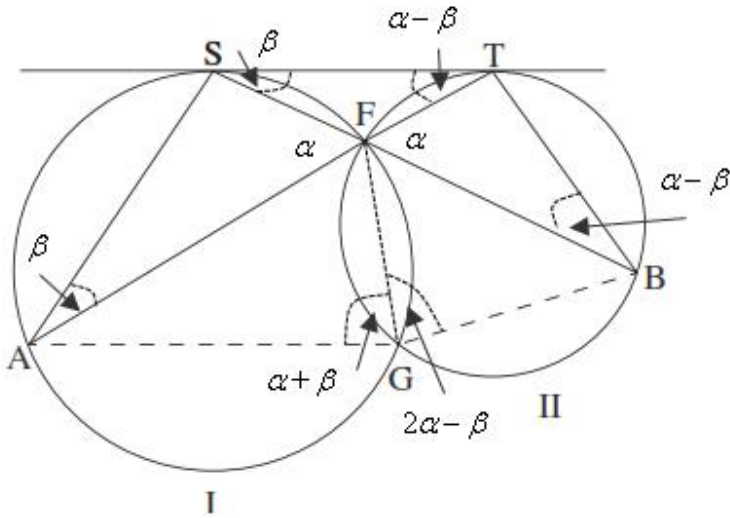
$$P_5(2) = \frac{5!}{2!(5-2)!} \cdot 0.1^2 \cdot 0.9^3$$

$$P_5(2) = 10 \cdot 0.1^2 \cdot 0.9^3$$

$$P_5(2) = 0.0729$$

$$P = \frac{0.32805}{0.0729 + 0.32805 + 0.59049} = \frac{0.32805}{0.00144} = \frac{45}{136}$$

$$\frac{45}{136} = 0.331$$



.S I ST .1
 .T II ST .2
 (2)
 B - G , A.3
 $\frac{ST}{AS} = \frac{TB}{ST}$: "
 . $\sphericalangle AGF = \sphericalangle SFA + \sphericalangle SAF$ (1) .
 $\sphericalangle SFA = 60^\circ$ (2)

	S I ST	4	1
((2))	() $\sphericalangle SAT = \sphericalangle TSB = s$	5	4
	T II ST	6	2
	() $\sphericalangle STA = \sphericalangle TBS$	7	6
	$\Delta TSA \sim \Delta BTS$	8	7,5
	$\frac{TS}{BT} = \frac{TA}{BS} = \frac{SA}{TS}$	9	8
	$\frac{ST}{AS} = \frac{TB}{ST}$	10	9
. . .			
	$\sphericalangle SFA = r$	11	
	$\widehat{ASF} = 2(r + s)$	12	11,5
	$\sphericalangle FGA = r + s$	13	12
()	$\sphericalangle AGF = \sphericalangle SFA + \sphericalangle SAF$	14	13,11,5
(1) . . .			

		'	
$\Delta STF -$	$\sphericalangle STA = r - s$	15	11,5
	$\sphericalangle TBS = r - s$	16	15,7
	$\sphericalangle TFB = \sphericalangle SFA = r$	17	11
	$\widehat{FTB} = 2(2r - s)$	18	17,16
	$\sphericalangle FGB = 2r - s$	19	18
	B - G , A	20	3
$180^\circ -$	$2r - s + r + s = 180^\circ$	21	20,19,13
	$r = 60^\circ$	22	21
	$\sphericalangle SFA = 60^\circ$	23	22,11
(2) . . .			

ונצבור פטריאון ואטריה פסעית ד'

$\Delta AFE - \sphericalangle AEF$

$$\cos \sphericalangle AEF = \frac{3}{5}$$

$$\sphericalangle AEF = 53.13^\circ$$

ΔEFD

$$\sphericalangle AEF) \sphericalangle EFD = \frac{53.13^\circ}{2} = 26.57^\circ$$

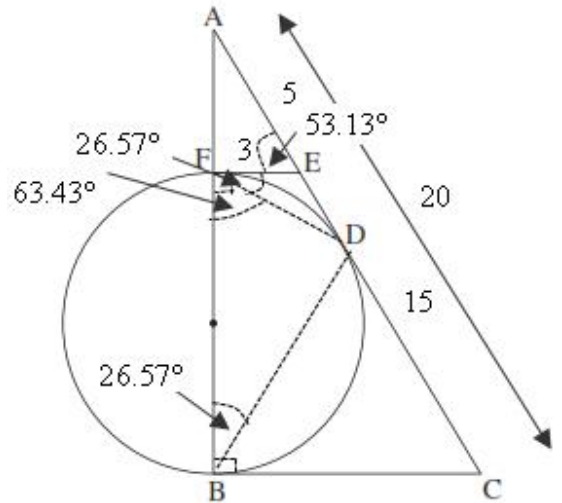
(, 14 ,

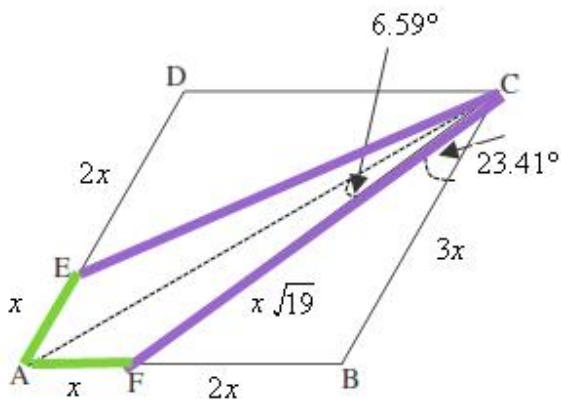
() $\sphericalangle DFB = 63.43^\circ$

() $\sphericalangle FDB = 90^\circ$

(... , 180° ΔFDB) $\sphericalangle FBD = 26.57^\circ$

. $\sphericalangle DFB = 63.43^\circ$, $\sphericalangle FDB = 90^\circ$, $\sphericalangle FBD = 26.57^\circ$:





- () AE = AF = x
- () FB = 2AF = 2x
- 3x () AB = 3x
- () DE = 2x
- () $\angle DCB = 60^\circ$
- (180° -) $\angle FBC = 120^\circ$

ΔFCB

$$(CF)^2 = (FB)^2 + (BC)^2 - 2FB \cdot BC \cdot \cos \angle FBC$$

$$(CF)^2 = (2x)^2 + (3x)^2 - 2 \cdot 2x \cdot 3x \cdot \cos 120^\circ$$

$$(CF)^2 = 19x^2$$

$$\boxed{CF = x\sqrt{19}}$$

ΔFCB

$$\frac{FB}{\sin \angle FCB} = \frac{FC}{\sin \angle FBC} \rightarrow \frac{2x}{\sin \angle FCB} = \frac{x\sqrt{19}}{\sin 120^\circ}$$

$$\frac{2x \sin 120^\circ}{x\sqrt{19}} = \sin \angle FCB$$

$$\boxed{\angle FCB = 23.41^\circ}$$

$\angle FCB = 23.41^\circ$:

ΔAC

$$() \angle ACB = 30^\circ$$

$$() \angle ACF = 6.59^\circ$$

$$() \angle CAF = 30^\circ$$

$$(180^\circ - \Delta ACF) \angle AFC = 143.41^\circ$$

ΔACF

$$\frac{FC}{\sin \angle CAF} = \frac{AC}{\sin \angle AFC} \rightarrow \frac{x\sqrt{19}}{\sin 30^\circ} = \frac{b}{\sin 143.41^\circ}$$

$$x\sqrt{19} = 0.8388b \rightarrow \boxed{FC = 0.8388b}$$

$$x = 0.1924b \rightarrow \boxed{AF = 0.1924b}$$

$$\Delta AECF \quad () \Delta FCB \cong \Delta ECD$$

$$2 \cdot 0.8388b + 2 \cdot 0.1924b = 2.0624b : \Delta AECF$$

" 2.0624b $\Delta AECF$:

$$0 \leq x \leq \frac{2f}{3}$$

$$f(x) = \cos^3(3x - f) :$$

$$f(x) = \cos^3(3x - f) = \cos^3(f - 3x) = -\cos^3 3x$$

$$f(0) = -\cos^3(3 \cdot 0) = -1 \rightarrow (0, -1)$$

$$, x = 0 \quad y -$$

$$, y = 0 \quad x -$$

$$0 = -\cos^3 3x \rightarrow \cos 3x = 0 \rightarrow 3x = \frac{f}{2} + fk \rightarrow x = \frac{f}{6} + \frac{f}{3}k$$

$$. x = \frac{f}{2} \quad k = 1 \quad , x = \frac{f}{6} \quad k = 0$$

$$. (\frac{f}{2}, 0) , (\frac{f}{6}, 0) , (0, -1) :$$

:

,

$$(0, -1), f(\frac{2f}{3}) = -\cos^3(3 \cdot \frac{2f}{3}) = -1 \rightarrow (\frac{2f}{3}, -1)$$

$$f'(x) = 3 \cos^2 3x \sin 3x$$

$$0 = 3 \cos^2 3x \sin 3x$$

$$\sin 3x = 0 \quad \cos 3x = 0 \rightarrow (\frac{f}{6}, 0), (\frac{f}{2}, 0) \text{ have been proved}$$

$$3x = fk \quad x = \frac{f}{3}k$$

$$k = 1 \rightarrow x = \frac{f}{3} \rightarrow f(\frac{f}{3}) = -\cos^3(3 \cdot \frac{f}{3}) = 1 \rightarrow (\frac{f}{3}, 1)$$

$$k = 0, 2 \rightarrow x = 0, x = \frac{2f}{3} \text{ end points}$$

,

,

$$(\frac{f}{6}, 0), (\frac{f}{2}, 0)$$

0		$\frac{f}{6}$		$\frac{f}{3}$		$\frac{f}{2}$		$\frac{2f}{3}$	x
-1		0		1		0		-1	$f(x)$
				0					$f'(x)$
Min	↖		↖	Max	↘		↘	Min	

$$. (\frac{f}{3}, 1) , (\frac{2f}{3}, -1) , (0, -1) :$$

"

(1).

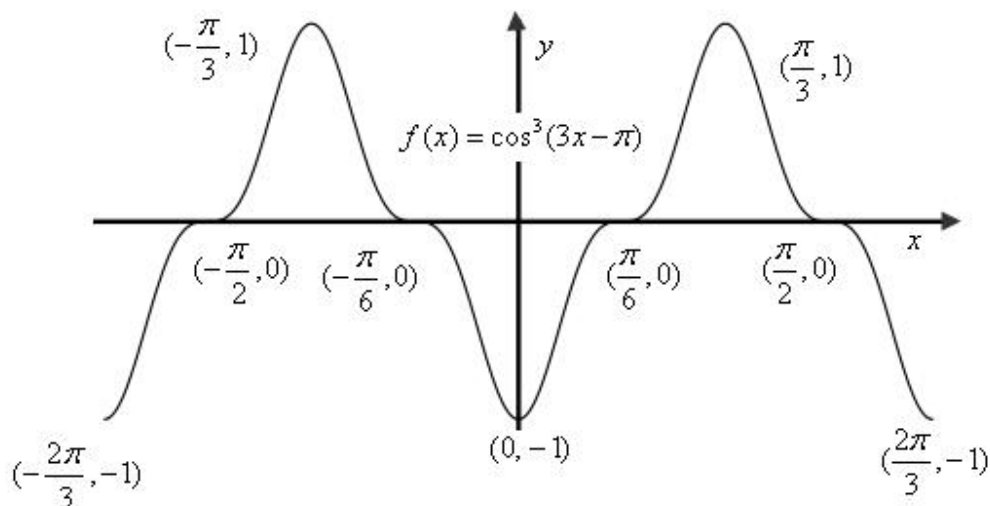
$$f(x) = -\cos^3 3x$$

$$f(-x) = -\cos^3(3(-x)) = -\cos^3(-3x) = -\cos^3 3x$$

$$f(-x) = f(x)$$

. y - (2)

. x - $(-\frac{f}{2}, 0), (-\frac{f}{6}, 0)$
 , $(-\frac{f}{3}, 1), (-\frac{2f}{3}, -1)$
 , $(0, -1)$
 :



.0 , .

. y = -1 , (0, -1)

.(,)

. y = 1 $(-\frac{f}{3}, 1) - (\frac{f}{3}, 1)$

,0 , $(-\frac{f}{2}, 0), (-\frac{f}{6}, 0), (\frac{f}{6}, 0), (\frac{f}{2}, 0)$

. y = 0

. y = 0 , y = 1 , y = -1 :

$$f(x) = \frac{x+1}{\sqrt{x^2-9}}$$

0 - , (1)
 $x = -3, 3$, $x^2 - 9 > 0$

$x < -3$ $x > 3$:
 $x = 0$ y (2)

$x = -1$ $y = 0$ x
 : (3)

$$f(x) = \frac{x+1}{\sqrt{x^2-9}} = \frac{x+1}{|x|\sqrt{1-\frac{9}{x^2}}}$$

$$\lim_{x \rightarrow +\infty} \frac{x+1}{|x|\sqrt{1-\frac{9}{x^2}}} = \lim_{x \rightarrow +\infty} \frac{x+1}{x\sqrt{1-\frac{9}{x^2}}} = \frac{1}{1} \rightarrow \boxed{y=1}$$

$$\lim_{x \rightarrow -\infty} \frac{x+1}{|x|\sqrt{1-\frac{9}{x^2}}} = \lim_{x \rightarrow -\infty} \frac{x+1}{-x\sqrt{1-\frac{9}{x^2}}} = \frac{1}{-1} \rightarrow \boxed{y=-1}$$

$$\lim_{x \rightarrow 3^+} \frac{x+1}{\sqrt{x^2-9}} = \lim_{x \rightarrow 3^+} \frac{4}{0^+} = +\infty \rightarrow \boxed{x=3}$$

$$\lim_{x \rightarrow -3^-} \frac{x+1}{\sqrt{x^2-9}} = \lim_{x \rightarrow -3^-} \frac{-2}{0^+} = -\infty \rightarrow \boxed{x=-3}$$

$x = -3, x = 3$: , $y = -1, y = 1$:

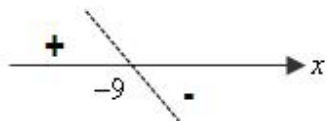
(4)

$$f(x) = \frac{x+1}{\sqrt{x^2-9}}$$

$$f'(x) = \frac{\sqrt{x^2-9} - \cancel{x}(x+1)}{\cancel{x^2-9}^2} = \frac{\sqrt{x^2-9} - x(x+1)}{(x^2-9)^2}$$

$$f'(x) = \frac{x^2-9-x^2-x}{(x^2-9)\sqrt{x^2-9}}$$

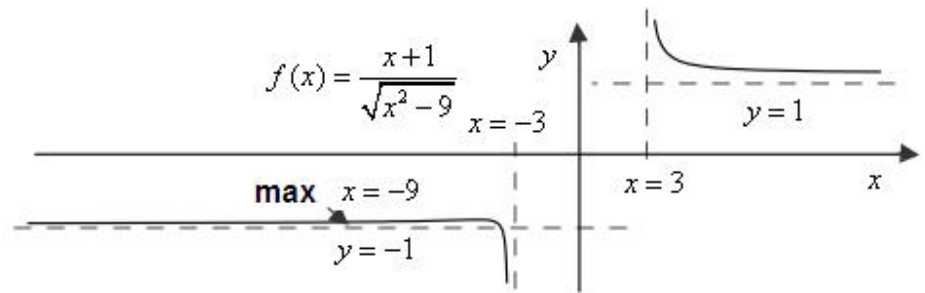
$$f'(x) = \frac{-9-x}{(x^2-9)\sqrt{x^2-9}}$$



$x = -9$ 0 , ,
 $x > 3$ $-9 < x < -3$ $x < -9$
 $x < -9$: , $-9 < x < -3$ $x > 3$:

$$x < -3$$

$$x > 3$$



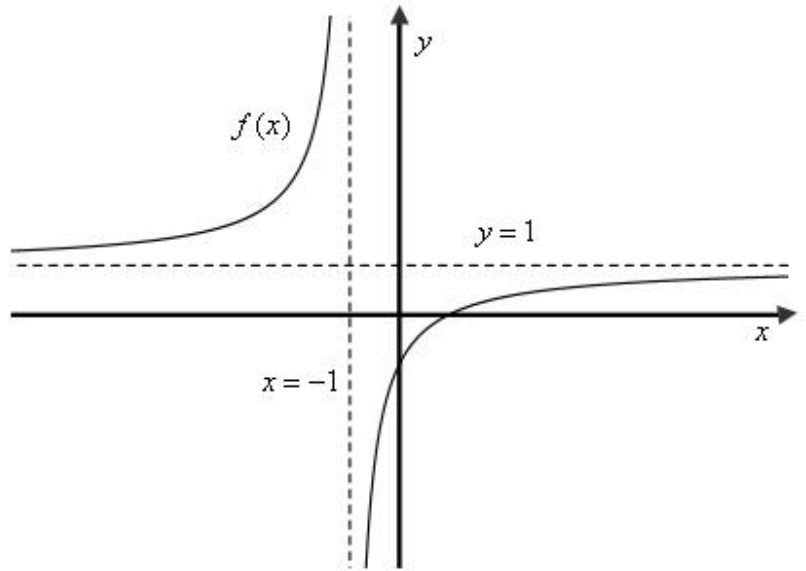
$$3 < k < t, \int_k^t (f'(x)) dx$$

$$\int_k^t (f'(x)) dx = f(x) \Big|_k^t = f(t) - f(k)$$

$$, 3 < k < t - x > 3 ,$$

$$. f(t) - f(k) < 0 \quad f(t) < f(k) -$$

$x \neq -1$ $f(x)$.
 $x > -1$ $f'(x)$.
 $x < -1$ $f''(x)$.
 $x > -1 : \cap$ $x < -1 : \cup$:
 $x < -1$ $x > -1$ $x \neq -1$.
 $y = 1, x = -1$:



$f(x) = \frac{ax+b}{cx+d}$ (1)

(1)

,

,

$y = 1$

$c = a, \frac{a}{c} = 1$

$d = c = a$

$c(-1) + d = 0$

,

$x = -1$

$-1 = \frac{a \cdot 0 + b}{c \cdot 0 + d}, f(0) = -1, (0, -1)$

y -

$b = -d = -a$

$d = a, c = a, b = -a$:

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

$$a \neq 0$$

$$, f(x) = \frac{ax-a}{ax+a} \quad \mathbf{(1)} \quad \mathbf{(2)}$$

$$\int_0^1 (f'(x) dx = f(x) \Big|_0^1 = f(1) - f(0) = \frac{1-1}{1+1} - (-1) = 1$$

. " 1 :