

, I - () x -
 . II - y -

()	()	()		
1	$\frac{1}{x}$	x	I	
1	$\frac{1}{y}$	y	II	
$\frac{7}{x}$	$\frac{1}{x}$	7	I	
$\frac{3}{y}$	$\frac{1}{y}$	3	II	
$\frac{1}{2}$	$\frac{1}{x}$	$\frac{1}{2}x$	I	
$\frac{1}{2}$	$\frac{1}{y}$	$\frac{1}{2}y$	II	

$$\begin{cases} \frac{7}{x} + \frac{3}{y} = 0.6 \\ \frac{1}{2}x = \frac{1}{2}y + 4 \end{cases} \rightarrow \boxed{x = y + 8}$$

$$\frac{7}{y+8} + \frac{3}{y} = 0.6 \quad / \cdot y(y+8)$$

$$7y + 3(y+8) = 0.6y(y+8)$$

$$0.6y^2 - 5.2y - 24 = 0$$

$$y_{1,2} = \frac{5.2 \pm 9.2}{1.2}$$

$$y = 12 \rightarrow x = 20$$

~~$$y = -3\frac{1}{3} \leftarrow y > 0$$~~

6 , 12 II -
 3 , 3
 , 20 I - : _____
 10
 3 , 7
 3 :

. d , $n > 2$, $a_1, a_2, a_3, \dots, a_{n-1}, a_n$:
 . $a_2^2 - a_1^2$, $a_3^2 - a_2^2$, ... , $a_n^2 - a_{n-1}^2$:

. $n-1$

. $b_n -$,

$$b_{n-1} = a_n^2 - a_{n-1}^2$$

$$b_{n-1} = (a_n - a_{n-1})(a_n + a_{n-1})$$

$$b_{n-1} = d(a_n + a_{n-1}) \rightarrow b_{n-2} = d(a_{n-1} + a_{n-2})$$

$$b_{n-1} - b_{n-2} = d(a_n + a_{n-1}) - d(a_{n-1} + a_{n-2})$$

$$b_{n-1} - b_{n-2} = d(a_n + a_{n-1} - a_{n-1} - a_{n-2})$$

$$b_{n-1} - b_{n-2} = d(a_n - a_{n-2})$$

$$b_{n-1} - b_{n-2} = d \cdot 2d$$

$$\boxed{b_{n-1} - b_{n-2} = 2d^2}$$

. $2d^2 -$,

$$. b_1 = 64 , a_2^2 - a_1^2 = 64$$

. $d - n$, b_{n-1} ,

$$b_{n-1} = b_1 + d_b(n-1-1)$$

$$\boxed{b_{n-1} = 64 + 2d^2(n-2)}$$

$$. 64 + 2d^2(n-2)$$

$$. b_{n-1} = 192 , a_n^2 - a_{n-1}^2 = 64$$

. n

$$192 = 64 + 2d^2(n-2) \quad / -64$$

$$128 = 2d^2(n-2) \quad / 2d^2 > 2$$

$$\frac{64}{d^2} = n-2$$

$$. n < 66 : \quad 64 > n-2 \quad \frac{64}{d^2} < 64 - \quad d^2 > 1 -$$

$$. 2 < n < 66 - , n > 2 ,$$

. n , $3 \leq n \leq 65 -$, n

. n , $3 \leq n \leq 65$ n :

"

$$1 - \frac{255}{256} = \frac{1}{256}$$

$P(A) =$

$$(P(\bar{A}) = 0.75) \quad P(A) = 0.25 \quad , (P(A))^4 = \frac{1}{256}$$

25% :

$k = 3, (p = 0.75, n = 4)$

$$P_4(3) = \binom{4}{3} \cdot 0.75^3 \cdot (1 - 0.75)^{4-3}$$

$$P_4(3) = \frac{4!}{3!(4-3)!} \cdot 0.75^3 \cdot 0.25^1$$

$$P_4(3) = 4 \cdot 0.75^3 \cdot 0.25$$

$$P_4(3) = \frac{27}{64}$$

$$\frac{27}{64} :$$

\bar{A} - A
 \bar{B} - B

$P(A) = 0.25 \rightarrow P(\bar{A}) = 0.75$:

$P(B) = 0.4 \rightarrow P(\bar{B}) = 0.6$

$P(A/B) = 0.25 \rightarrow P(\bar{A}/B) = 0.75$

	\bar{A}	A	
0.4	0.3	0.1	B
0.6	0.45	0.15	\bar{B}
1	0.75	0.25	

$P(A/B) = \frac{P(A \cap B)}{P(B)}$

$0.25 = \frac{P(A \cap B)}{0.4}$

$P(A \cap B) = 0.1$

$P(B/A) = \frac{P(B \cap A)}{P(A)}$

$P(B/A) = \frac{0.1}{0.25}$

$P(B/A) = 0.4$

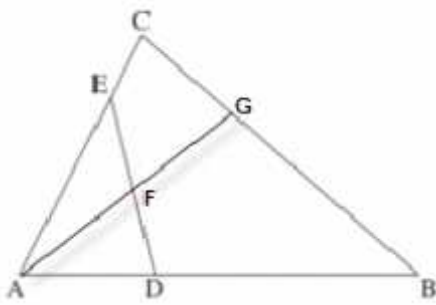
$.0.4^2 = 0.16$ ()

$.0.16$:

$P(A/B) = P(A)$ - _____

" " " "

BDEC .1



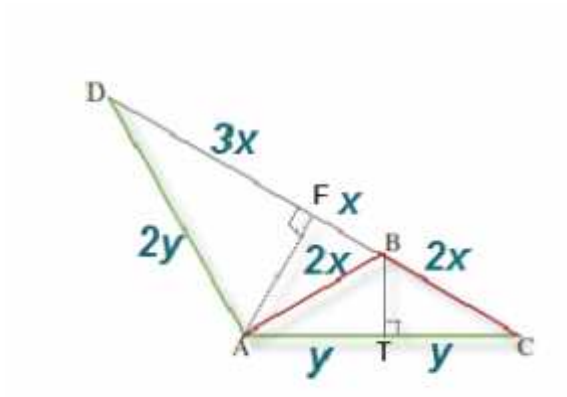
$$\sphericalangle EAF = \sphericalangle DAF \quad .3 \quad \frac{S_{\Delta ACB}}{S_{\Delta ADE}} = 4 \quad .2 :$$

$\Delta ADE \sim \Delta ACB$. : "

$$\frac{CG}{BG} = \frac{AD}{AE} \quad \cdot \quad \frac{EF}{BG} \quad (2) \quad \Delta AEF \sim \Delta ABG \quad (1) .$$

	BDEC	4	1
180° -	$\sphericalangle B + \sphericalangle CED = 180^\circ$	5	4
180° -	$\sphericalangle AED + \sphericalangle CED = 180^\circ$	6	
	() $\sphericalangle AED = \sphericalangle B$	7	6,5
	() $\sphericalangle A = \sphericalangle A$	8	
	$\Delta ADE \sim \Delta ACB$	9	8,7
. . .			
	() $\sphericalangle EAF = \sphericalangle DAF$	10	3
	() $\sphericalangle AEF = \sphericalangle B$	11	7
	$\Delta AEF \sim \Delta ABG$	12	11,10
(1) . . .			
	$\frac{S_{\Delta ACB}}{S_{\Delta ADE}} = 4$	13	2
	$\frac{AD}{AC} = \frac{AE}{AB} = \frac{DE}{CB} = \frac{1}{2}$	14	13,9
	$\frac{AE}{AB} = \frac{AF}{AG} = \frac{EF}{BG}$	15	12
	$\frac{EF}{BG} = \frac{1}{2}$	16	15,14
(2) . . .			
ΔABC	$\frac{GC}{BG} = \frac{AC}{AB}$	17	10
	$\frac{AD}{AE} = \frac{AC}{AB}$	18	14
	$\frac{CG}{BG} = \frac{AD}{AE}$	19	18,17
. . .			

.() (AD = AC) $\triangle ADC$.
 ,() BT \perp AC .() AD = AC = 2y
 .(") AT = TC = y :
 .() (AB = BC) $\triangle ABC$
 .() AF \perp AC .() AB = BC = 2x
 .() DC = 3BC = 6x
 .(") DF = CF = 3x :



$\triangle TCB$

$$\cos \sphericalangle C = \frac{TC}{BC}$$

$$\boxed{\cos \sphericalangle C = \frac{y}{2x}}$$

$\triangle FCA$

$$\cos \sphericalangle C = \frac{FC}{AC}$$

$$\boxed{\cos \sphericalangle C = \frac{3x}{2y}}$$

:

$$\frac{y}{2x} = \frac{3x}{2y}$$

$$y^2 = 3x^2$$

$$\frac{y}{x} = \sqrt{3}$$

. $\sphericalangle A = 120^\circ$, $\sphericalangle D = 30^\circ$ - $\sphericalangle C = 30^\circ$ -

$$\cos \sphericalangle C = \frac{\sqrt{3}}{2} :$$

. $\sphericalangle A = 120^\circ$, $\sphericalangle D = \sphericalangle C = 30^\circ$:

:

() $\triangle TCB \sim \triangle FCA$

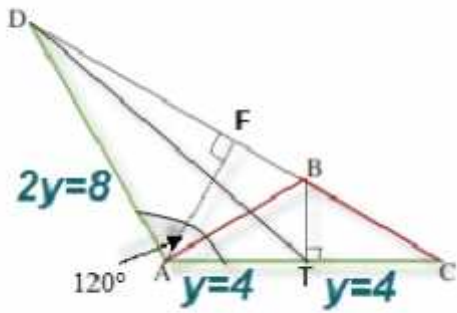
$$\frac{TC}{FC} = \frac{TB}{FA} = \frac{CB}{CA}$$

$$\frac{y}{3x} = \frac{2x}{2y}$$

$$y^2 = 3x^2$$

$$\frac{y}{x} = \sqrt{3}$$

"



$$16\sqrt{3} \quad \Delta ADC$$

$$S_{\Delta ADC} = \frac{AD \cdot AC \cdot \sin \sphericalangle A}{2}$$

$$16\sqrt{3} = \frac{2y \cdot 2y \cdot \sin 120^\circ}{2}$$

$$16\sqrt{3} = y^2 \sqrt{3}$$

$$y = 4 \quad \leftarrow y > 0$$

$$AD = 8 \text{ cm}$$

$$AT = CT = 4 \text{ cm}$$

ΔADT

$$(DT)^2 = (AD)^2 + (AT)^2 - 2AD \cdot AT \cdot \cos \sphericalangle A$$

$$(DT)^2 = 8^2 + 4^2 - 2 \cdot 8 \cdot 4 \cdot \cos 120^\circ$$

$$(DT)^2 = 112$$

$$\boxed{DT = 4\sqrt{7} \text{ cm}} \quad \leftarrow DT > 0$$

$$\therefore \text{ " } 4\sqrt{7} \quad DT \quad :$$

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

$$0 < x < f \quad f(x), \quad x = fk \quad \sin x$$

$$0 < x < f \quad :$$

$$x = 0, x = f \quad f(x), \quad x = fk \quad (1)$$

$$x = 0, x = f \quad f(x) \quad :$$

$$:(\quad) \quad (2)$$

$$f(x) = 2x + \frac{\cos x}{\sin x}$$

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

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

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

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

$$\boxed{f'(x) = \frac{-\cos 2x}{\sin^2 x}}$$

(,)

$$0 = -\cos 2x$$

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

$$x = \frac{f}{4} + \frac{f}{2}k$$

$$k = 0: \quad x = \frac{f}{4} \rightarrow f\left(\frac{f}{4}\right) = 2 \cdot \frac{f}{4} + \cot \frac{f}{4} = \frac{f}{2} + 1$$

$$k = 1: \quad x = \frac{3f}{4} \rightarrow f\left(\frac{3f}{4}\right) = 2 \cdot \frac{3f}{4} + \cot \frac{3f}{4} = \frac{3f}{2} - 1$$

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

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

$$f''\left(\frac{f}{4}\right) = \frac{\sin\left(2 \cdot \frac{f}{4}\right)}{\sin^4 \frac{f}{4}} > 0 \rightarrow \left(\frac{f}{4}, \frac{f}{2} + 1\right), \min$$

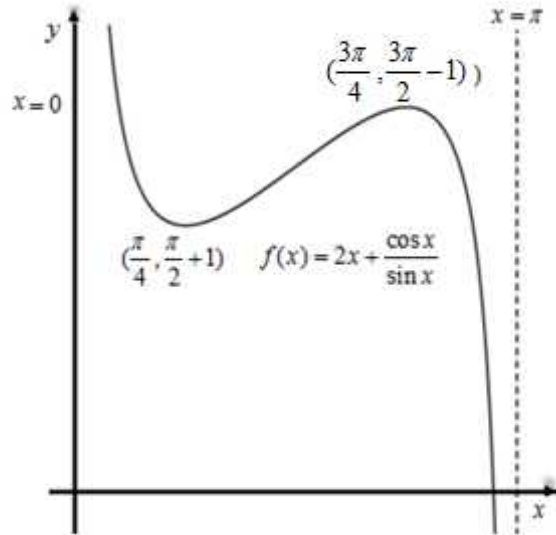
$$f''\left(\frac{3f}{4}\right) = \frac{\sin\left(2 \cdot \frac{3f}{4}\right)}{\sin^4 \frac{3f}{4}} < 0 \rightarrow \left(\frac{3f}{4}, \frac{3f}{2} - 1\right), \max$$

$$\left(\frac{3f}{4}, \frac{3f}{2} - 1\right), \quad \left(\frac{f}{4}, \frac{f}{2} + 1\right) :$$

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$f(x)$

(3)



מקסימום שיפוע המשיק לארץ הפונקציה.

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 .()

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

$$0 = \sin 2x$$

$$2x = \pi k$$

$$x = \frac{\pi}{2} k$$

$$k=1: x = \frac{\pi}{2} \quad \left(\frac{\pi}{4} < x < \frac{3\pi}{4}\right)$$

$$\left. \begin{aligned} f''(0.4\pi) &= \sin 0.8\pi > 0 \\ f''(0.6\pi) &= \sin 1.2\pi < 0 \end{aligned} \right\} x = \frac{\pi}{2}, \text{max}$$

$$m = f'\left(\frac{\pi}{2}\right) = 2 - \frac{1}{\sin^2\left(\frac{\pi}{2}\right)} = 2 - \frac{1}{1} = 1: x = \frac{\pi}{2}$$

45°

$$m = \tan \alpha$$

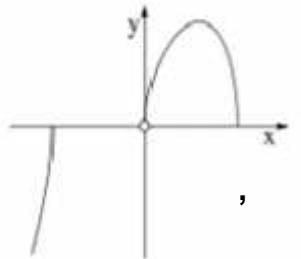
, $x =$

45°

, $x =$

,

:



$$f(x) = \frac{\sqrt{12x^3 - x^5}}{x}$$

$$x \leq -2\sqrt{3}, 0 < x \leq 2\sqrt{3}$$

(

$$y = k$$

y -

x -

y -

x > 0 -

$$f'(x) = \frac{\frac{x(36x^2 - 5x^4)}{2\sqrt{12x^3 - x^5}} - \sqrt{12x^3 - x^5}}{x^2}$$

$$f'(x) = \frac{36x^3 - 5x^5 - 2(12x^3 - x^5)}{2x^2\sqrt{12x^3 - x^5}}$$

$$f'(x) = \frac{12x^3 - 3x^5}{2x^2\sqrt{12x^3 - x^5}}$$

$$0 = 12x^3 - 3x^5 \quad /: 3x^3 > 0$$

$$0 = 4 - x^2$$

$$x = 2$$

$$y = f(2) = \frac{\sqrt{12 \cdot 2^3 - 2^5}}{2} = 4$$

$$x = -2$$

$$0 < k < 4$$

, 4 , ,

y -

$$0 \leq k < 4, x -$$

$$y = k$$

$$0 \leq k < 4:$$

$$x \leq -2\sqrt{3}, 0 \leq x \leq 2\sqrt{3}$$

$$g(x) = \sqrt{12x - x^3}$$

$$f(x) = \frac{\sqrt{12x^3 - x^5}}{x}$$

$$g(x) = \sqrt{\frac{12x^3 - x^5}{x^2}} = \sqrt{12x - x^3}$$

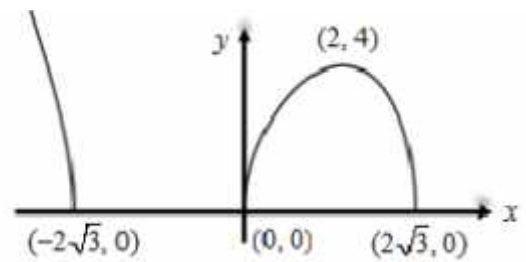
() (0,0)

, f(x)

$$g(x) = \begin{cases} |f(x)| & x \neq 0 \\ 0 & x = 0 \end{cases}$$

(2) _____

(2)



, (2, 4)

, (-2*sqrt(3), 0), (0, 0), (2*sqrt(3), 0)

(1) _____

(1)

, $x < -2\sqrt{3}$ $2 < x < 2\sqrt{3}$: , $0 < x < 2$:

, $y = k$ $0 \leq k < 4$ **(3)**

$$f'(x) = x^2 - 6x + 5 : \quad x \quad f(x)$$

$$y = 10\frac{2}{3}$$

$$f'(x) = x^2 - 6x + 5$$

$$0 = x^2 - 6x + 5 = (x-1)(x-5)$$

$$x = 1, \quad x = 5$$

$$f''(x) = 2x - 6$$

$$f'(1) = 2 \cdot 1 - 6 < 0 \rightarrow \max \rightarrow \boxed{(1, 10\frac{2}{3}), \max}$$

$$f'(5) = 2 \cdot 5 - 6 > 0 \rightarrow \min$$

$$f(x) = \int f'(x) dx$$

$$f(x) = \int (x^2 - 6x + 5) dx$$

$$f(x) = \frac{x^3}{3} - 3x^2 + 5x + c$$

$$10\frac{2}{3} = \frac{1^3}{3} - 3 \cdot 1^2 + 5 \cdot 1 + c$$

$$8\frac{1}{3} = c$$

$$\boxed{f(x) = \frac{x^3}{3} - 3x^2 + 5x + 8\frac{1}{3}}$$

$$f(5) = \frac{5^3}{3} - 3 \cdot 5^2 + 5 \cdot 5 + 8\frac{1}{3} = 0 \rightarrow \boxed{(5, 0), \min}$$

$$(5, 0), \quad (1, 10\frac{2}{3}) :$$

$$f'(x) = g'(x) : \quad x \quad g(x)$$

, 1

$f(x)$

$$g_2(x) = \frac{x^3}{3} - 3x^2 + 5x + 7\frac{1}{3} \quad g_1(x) = \frac{x^3}{3} - 3x^2 + 5x + 9\frac{1}{3} :$$

y

$$(5, 1), \quad (1, 11\frac{2}{3}) :$$

$$(5, -1), \quad (1, 9\frac{2}{3}) :$$

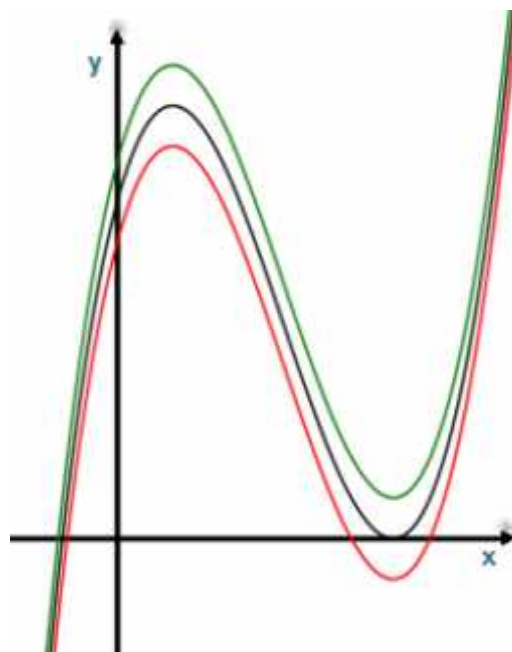
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(1)

$$f(x) = \frac{x^3}{3} - 3x^2 + 5x + 8\frac{1}{3}$$

$$g_1(x) = \frac{x^3}{3} - 3x^2 + 5x + 9\frac{1}{3}$$

$$g_2(x) = \frac{x^3}{3} - 3x^2 + 5x + 7\frac{1}{3}$$



(2)

$f(x)$ -

,

y -

y -

x -

$(g_1(x))$

:

x -

$(f(x))$

x -

$(g_2(x))$