

$x = \dots$

$(\dots) B \quad A$

$s = \dots$

:

$s = \dots$	$v = \dots$	$t = \dots$	
S	$\frac{S}{6}$	6	$B - A = \dots$
S	$\frac{S}{4-x}$	$6-x-2=4-x$	$B - A = \dots$
$(1+x) \cdot \frac{S}{x}$	$\frac{S}{6}$	$1+x$	$A = \dots$
$\frac{S}{4-x}$	$\frac{S}{4-x}$	1	$A = \dots$

$(1+x) \cdot \frac{S}{6} = \frac{S}{4-x} : \dots , \dots$

:

$(1+x) \cdot \frac{S}{6} = \frac{S}{4-x} \quad /: S > 0$

$\frac{(1+x)}{6} = \frac{1}{4-x} \quad / \cdot 6(4-x)$

$(1+x)(4-x) = 6$

$4-x+4x-x^2 = 6$

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

$0 = (x-1)(x-2)$

$\boxed{x=1} \quad \boxed{x=2}$

:

. $3n$.
 $a_1, \dots, a_n, a_{n+1}, \dots, a_{2n}, a_{2n+1}, \dots, a_{3n}$

2 () n
 .() n

n	n	
$a_{n+1} = a_1 + d(n+1-1) = a_1 + dn$	$a_{2n+1} = a_1 + d(2n+1-1) = a_1 + 2dn$	A ₁
d	d	D
n	n	N

. $S_{first\ n} = 0$, , $S_{last\ n} = 2S_{middle\ n}$

$$\frac{n[2(a_1 + 2dn) + d(n-1)]}{2} = 2 \frac{n[2(a_1 + dn) + d(n-1)]}{2} \quad /: (\frac{n}{2} > 0)$$

$$[2(a_1 + 2dn) + d(n-1)] = 2[2(a_1 + dn) + d(n-1)]$$

$$2a_1 + 4dn + dn - d = 4a_1 + 4dn + 2dn - 2d$$

$$0 = 2a_1 + dn - d$$

$$\boxed{0 = 2a_1 + d(n-1)}$$

$$S_{first\ n} = \frac{n[2a_1 + d(n-1)]}{2}$$

$$S_{first\ n} = \frac{n[0]}{2}$$

$$\boxed{S_{first\ n} = 0}$$

. :

.0 .

$$a_5 + a_7 = 0$$

$$a_1 + 4d + a_1 + 6d = 0$$

$$2a_1 + 10d = 0$$

$$\boxed{a_1 = -5d}$$

.n $0 = 2a_1 + d(n-1)$

a_1 (-5d)

,0

,726

.0

$$0 = 2(-5d) + d(n-1) \quad /: d \neq 0$$

$$0 = -10 + n - 1$$

$$n = 11$$

$$.3n = 33$$

"

$$S_{33} = 726$$

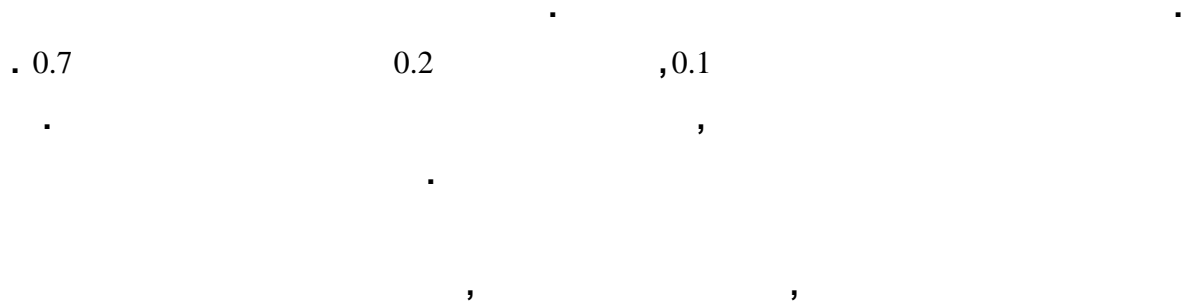
$$726 = \frac{33[2a_1 + d(33-1)]}{2} \quad /: \frac{33}{2}$$

$$44 = 2(-5d) + 32d$$

$$44 = 22d \quad /: 22$$

$$\boxed{d = 2}$$

.2 :



$$P(\text{Papa will score more than 1 point}) = 0.2 \cdot 0.2 + 0.2 \cdot 0.7 + 0.7 \cdot 0.2 = 0.32$$

$$0.32$$

$$P(\text{Dani will score at least 1 point}) = 1 - 0.32 = 0.68$$

$$0.68$$

$$\begin{aligned}
 &P(\text{Dani won one round and tied the other one} / \text{Dani scored at least 1 point}) = \\
 &= \frac{P(\text{Dani won one round and tied the other one} \cap \text{Dani scored at least 1 point})}{P(\text{Dani scored at least 1 point})} = \\
 &= \frac{0.1 \cdot 0.7 + 0.7 \cdot 0.1}{0.68} = \frac{0.14}{0.68} = \frac{7}{34}
 \end{aligned}$$

$$\frac{7}{34}$$

$$k = 2, \binom{4}{k} p^k (1-p)^{4-k}, p = 0.68, n = 4$$

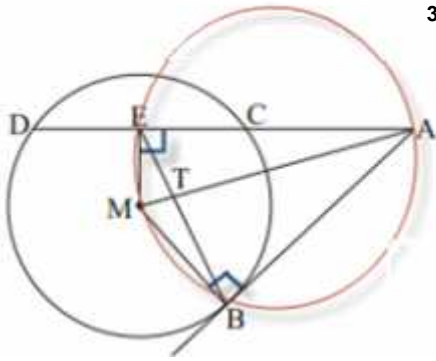
$$P_4(2) = \binom{4}{2} \cdot (0.68)^2 \cdot (1-0.68)^{4-2}$$

$$P_4(2) = \frac{4!}{2!(4-2)!} \cdot 0.68^2 \cdot 0.32^2$$

$$P_4(2) = 6 \cdot 0.68^2 \cdot 0.32^2$$

$$P_4(2) = 0.2841$$

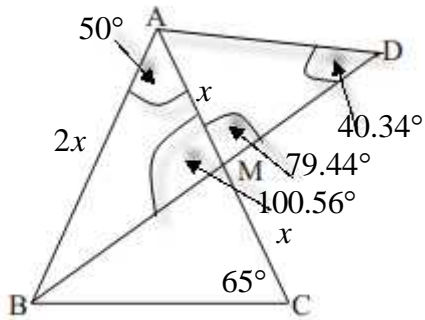
$$0.2841$$



AEMB

M .3 DE = EC .2 AB .1
 ΔBDC - T .4 :
 MT = " 1 .6 TE = " $\frac{\sqrt{10}}{2}$.5 :
 . TB² = 2MT · TA . . AEMB . : "

	AB	7	1
	M	8	3
	$\sphericalangle ABM = 90^\circ$	9	8,7
	DE = EC	10	2
	$\sphericalangle MEA = 90^\circ$	11	10,8
	$\sphericalangle ABM + \sphericalangle MEA = 180^\circ$	12	11,9
180°	AEMB	13	12
. . .			
,	ET · TB = MT · TA	14	13
	ΔBDC - T	15	4
2:1	$ET = \frac{TB}{2}$	19	18,17
	$\frac{TB}{2} \cdot TB = MT \cdot TA$	20	19,14
	TB ² = 2MT · TA	21	20
. . .			
	TE = " $\frac{\sqrt{10}}{2}$	22	5
	MT = " 1	23	6
	TB = " $\sqrt{10}$	24	22,19
	$(\sqrt{10})^2 = 2 \cdot 1 \cdot TA$	25	24,23,21
	TA = " 5	26	25
	MA = " 6	27	26,23
	AEMB MA	28	9
	" 3 AEMB	29	28,27
. . .			



. $AM = MC = x$, $AB = AC = 2x$:

$\sphericalangle BAC = 50^\circ \rightarrow \sphericalangle ABC = \sphericalangle ACB = 65^\circ$

(180° ")

ΔBAM

$(BM)^2 = (AB)^2 + (AM)^2 - 2AB \cdot AM \cdot \cos \sphericalangle BAC$

$(BM)^2 = (2x)^2 + x^2 - 2 \cdot 2x \cdot x \cdot \cos 50^\circ$

$(BM)^2 = 2.4288x^2$

$BM = 1.5585x$

ΔBAM

$\frac{BM}{\sin \sphericalangle BAC} = \frac{AB}{\sin \sphericalangle AMB}$

$\sin \sphericalangle AMB = \frac{2x \sin 50^\circ}{1.5585x}$

$\sin \sphericalangle AMB = 0.9831$

$\sphericalangle AMB = 100.56^\circ \leftarrow \sphericalangle AMB > 90^\circ$

$\sphericalangle AMD = 79.44^\circ$

. $\sphericalangle AMB = 100.56^\circ$:

. " 10 ΔABC :

ΔABC

$\frac{AB}{\sin \sphericalangle ACB} = 2R$

$AB = 2 \cdot 10 \sin 65^\circ$

$AB = 18.126 \text{ cm}$

. " 14 ΔABD :

ΔABD

$\frac{AB}{\sin \sphericalangle ADB} = 2R$

$\frac{18.126}{2 \cdot 14} = \sin \sphericalangle ADB$

$0.4674 = \sin \sphericalangle ADB$

$\sphericalangle ADB = 40.34^\circ$

. 180°

. $180^\circ \Delta ADM - \sphericalangle DAM = 60.22^\circ$

. $\sphericalangle DAM = 60.22^\circ$, $\sphericalangle ADM = 40.34^\circ$, $\sphericalangle AMD = 79.44^\circ$:

"

$$0 \leq x \leq f \quad g(x) = \sin(2x) - f(x) = 2 \sin^2 x : \quad (1)$$

$$2 \sin^2 x = \sin 2x$$

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

$$2 \sin x (\sin x - \cos x) = 0$$

$$\sin x = 0$$

$$\sin x = \cos x \quad / : \cos x \neq 0$$

$$\tan x = 1$$

$$x = f k$$

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

$$x = 0 \rightarrow (0, 0)$$

$$x = \frac{f}{4} \rightarrow (\frac{f}{4}, 1)$$

$$x = f \rightarrow (f, 0)$$

$$x = \frac{f}{4}, x = f, x = 0 :$$

x -

(2)

$$\sin 2x = 0$$

$$2x = f k$$

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

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

$$\sin x = 0$$

$$x = 0 \rightarrow (0, 0)$$

$$x = f k$$

$$x = 0 \rightarrow (0, 0)$$

$$x = \frac{f}{2} \rightarrow (\frac{f}{2}, 0)$$

$$x = f \rightarrow (f, 0)$$

$$x = f \rightarrow (f, 0)$$

$$(f, 0), (\frac{f}{2}, 0), (0, 0) : g(x) \quad (f, 0), (0, 0) : f(x) :$$

$$h(x) = x - \frac{\sin(2x)}{2} \quad (1)$$

$$h'(x) = 1 - \frac{2 \cos(2x)}{2}$$

$$h'(x) = 1 - (1 - 2 \sin^2 x)$$

$$h'(x) = 2 \sin^2 x$$

$$\boxed{h'(x) = f(x)}$$

∴

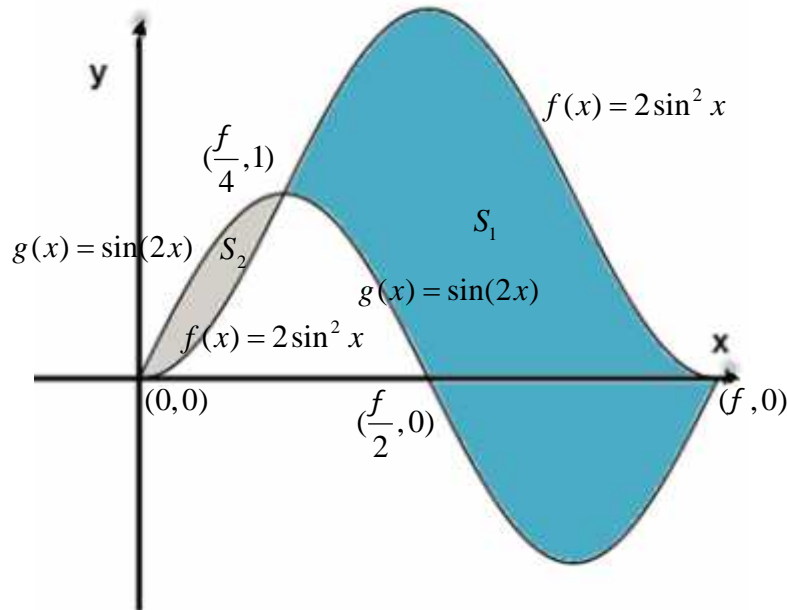
$$, 0 \leq x \leq f \quad g(x) = \sin(2x) - f(x) = 2 \sin^2 x : \quad (2)$$

x -

$$, S_2 - S_1$$

$$f\left(\frac{f}{8}\right) = 2 \sin^2\left(\frac{f}{8}\right) = 0.29 < g\left(\frac{f}{8}\right) = \sin\left(2 \cdot \frac{f}{8}\right) = 0.707$$

$$f\left(\frac{3f}{4}\right) = 2 \sin^2\left(\frac{3f}{4}\right) = 1 > g\left(\frac{3f}{4}\right) = \sin\left(2 \cdot \frac{3f}{4}\right) = -1$$



$$\int (2 \sin^2 2x) dx = x - \frac{\sin(2x)}{2} + c : \quad (1)$$

$$, S_2 - S_1 :$$

$$S_2 = \int_0^{\frac{f}{4}} (\sin(2x) - 2 \sin^2 2x) dx =$$

$$S_1 = \int_{\frac{f}{4}}^f (2 \sin^2 2x - \sin(2x)) dx =$$

$$S_2 = \left[-\frac{\cos(2x)}{2} - x + \frac{\sin(2x)}{2} \right]_0^{\frac{f}{4}} =$$

$$S_1 = \left[x - \frac{\sin(2x)}{2} + \frac{\cos(2x)}{2} \right]_{\frac{f}{4}}^f =$$

$$x = \frac{f}{4} \quad -\frac{\cos(2 \cdot \frac{f}{4})}{2} - \frac{f}{4} + \frac{\sin(2 \cdot \frac{f}{4})}{2} = 0 - \frac{f}{4} + \frac{1}{2}$$

$$x = f \quad f - \frac{\sin(2f)}{2} + \frac{\cos(2f)}{2} = f - 0 + \frac{1}{2}$$

$$x = 0 \quad -\frac{\cos(2 \cdot 0)}{2} - 0 + \frac{\sin(2 \cdot 0)}{2} = -\frac{1}{2} - 0 + 0$$

$$x = \frac{f}{4} \quad \frac{f}{4} - \frac{\sin(2 \cdot \frac{f}{4})}{2} + \frac{\cos(2 \cdot \frac{f}{4})}{2} = \frac{f}{4} - \frac{1}{2} + 0$$

$$S_2 = \left(-\frac{f}{4} + \frac{1}{2}\right) - \left(-\frac{1}{2}\right)$$

$$S_1 = \left(f + \frac{1}{2}\right) - \left(\frac{f}{4} - \frac{1}{2}\right)$$

$$\boxed{S_2 = -\frac{f}{4} + 1}$$

$$\boxed{S_1 = \frac{3f}{4} + 1}$$

$$S = S_2 + S_1 = \frac{3f}{4} + 1 + -\frac{f}{4} + 1 = \frac{f}{2} + 2 :$$

$$\cdot \frac{f}{2} + 2$$

:

"

$(a > 0) f(x) = \sqrt{ax^2 + 9}$

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

$f(x) = \sqrt{ax^2 + 9}$ (2)

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

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

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

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

$$f''(x) = \frac{9a}{(ax^2 + 9)\sqrt{ax^2 + 9}}$$

$-a > 0$, x

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

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

$f''(x) = \frac{9a}{(ax^2 + 9)\sqrt{ax^2 + 9}}$ (2)

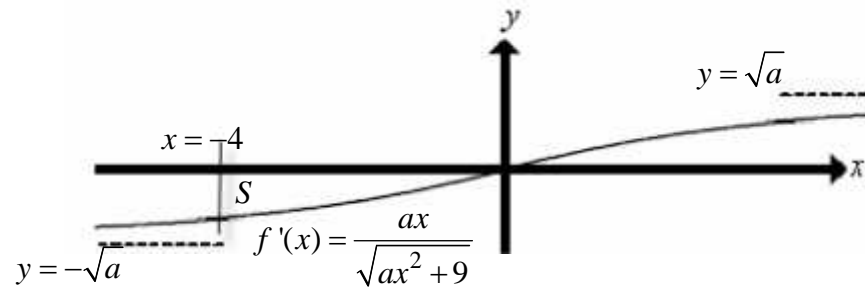
$\lim_{x \rightarrow \infty} \frac{ax}{\sqrt{ax^2 + 9}} = \lim_{x \rightarrow \infty} \frac{ax}{\sqrt{a}|x|\sqrt{1 + \frac{9}{ax^2}}} = \lim_{x \rightarrow \infty} \frac{\sqrt{a}x}{|x|} = \pm\sqrt{a}$

$y = \sqrt{a}$, $y = -\sqrt{a}$

$f'(x) = \frac{ax}{\sqrt{ax^2 + 9}}$, $f''(x) > 0$ (3)

$$f'(x) = \frac{ax}{\sqrt{ax^2+9}} \quad (4)$$

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



. 2 -

$$S = \int_{-4}^0 (0 - f'(x)) dx$$

$$S = -f(x) \Big|_{-4}^0$$

$$S = (-f(0)) - (-f(-4))$$

$$S = (-\sqrt{a \cdot 0^2 + 9}) + f(-4)$$

$$\boxed{S = -3 + f(-4)}$$

$$2 = -3 + f(-4)$$

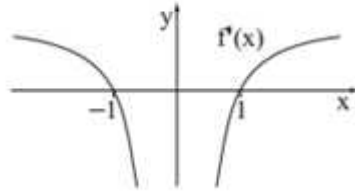
$$\boxed{f(-4) = 5}$$

$$f(-x) = \sqrt{a(-x)^2+9} = \sqrt{ax^2+9} = f(x) : \quad f(x) = \sqrt{ax^2+9}$$

$$f(4) = f(-4) = 5 :$$

$$f(4) = 5, f(-4) = 5 :$$

$f'(x)$



$f(x)$

$x = 0$ $f(x)$

:

$f(x)$ $x < -1$ $x > 1$

$f(x)$ $-1 < x < 0$ $0 < x < 1$

$x < 0$ \cap $f(x)$ $f''(x) < 0$ $x < 0$

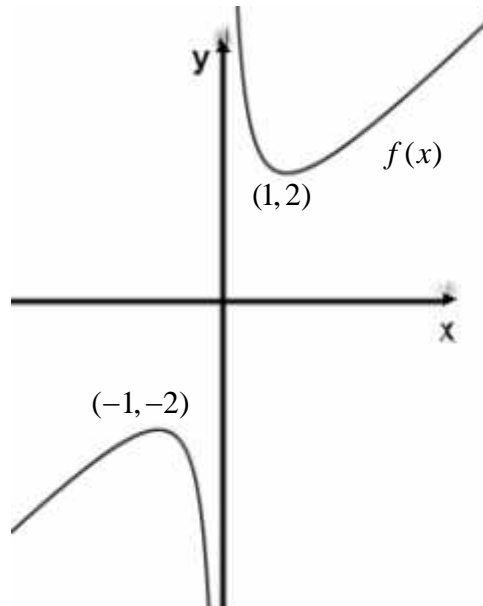
$x > 0$ \cup $f(x)$ $f''(x) > 0$ $x > 0$

$f(x)$ $x \rightarrow \pm\infty$,

$x = -1$ $x = 1$

$(-1, -2)$ $f(x) = -2$

$(1, 2)$ $f(x) = 2$



$$(a, b \neq 0) \quad f'(x) = \frac{ax^2 - b}{ax^2}$$

$$. a = b - \quad 0 = a(-1)^2 - b : \quad f'(1) = 0$$

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

(1,2)

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

$$f(x) = \int \left(1 - \frac{1}{x^2}\right) dx$$

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

$$2 = 1 + \frac{1}{1} + c$$

$$0 = c$$

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

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