

35806

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t, p - (1).

:

s	v	t	
$v(t-2)$	v	$t-2$	A -
$4t$	4	t	A -
$v(p-1)$	v	$p-1$	A -
$5p$	5	p	A -

$v(t-2) = 4t$:

:08:00

v

$v(t-2) = 4t$

$vt - 2v = 4t$

$vt - 4t = 2v$

$t(v-4) = 2v$

$$t = \frac{2v}{v-4}$$

.($v > 4$)

$$\frac{2v}{v-4}$$

:08:00

:

(2)

$v(p-1) = 5t$:

. 1

09:00

v

$v(p-1) = 5p$

$vp - v = 5p$

$vp - 5p = v$

$p(v-5) = v$

$$p = \frac{v}{v-5}$$

$$p+1 = \frac{v}{v-5} + 1 = \frac{v+v-5}{v-5} = \frac{2v-5}{v-5}$$

$$p+1 = \frac{2v-5}{v-5}$$

"

• $(0 < v < 2.5 \quad v > 5)$

$$\frac{2v-5}{v-5}$$

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:

10 - _____ ,

$$\frac{10}{60} = \frac{1}{6}$$

$$\frac{2v}{v-4} - \frac{2v-5}{v-5} > \frac{1}{6}$$

$$\frac{2v}{v-4} - \frac{2v-5}{v-5} - \frac{1}{6} > 0$$

$$\frac{12v(v-5) - 6(v-4)(2v-5) - (v-4)(v-5)}{6(v-5)(v-4)} > 0$$

$$\frac{12v^2 - 60v - 6(2v^2 - 5v - 8v + 20) - (v^2 - 5v - 4v + 20)}{6(v-5)(v-4)} > 0$$

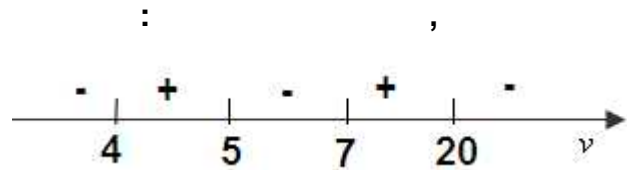
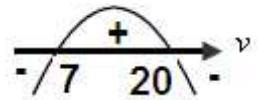
$$\frac{12v^2 - 60v - 12v^2 + 78v - 120 - v^2 + 9v - 20}{6(v-5)(v-4)} > 0$$

$$\frac{-v^2 + 27v - 140}{6(v-5)(v-4)} > 0$$

$$\frac{-v^2 + 27v - 140}{6(v-5)(v-4)} > 0$$

$$-v^2 + 27v - 140 = 0$$

$$v_{1,2} = \frac{-27 \pm 13}{-2} \rightarrow v_1 = 7, v_2 = 20$$



$$.4 < v < 5 \quad 7 < v < 20$$

$$7 < v < 20$$

$$, v > 5 -$$

$$7 < v < 20 :$$

"

$$\begin{cases} a_1 = \frac{5}{4} \\ a_{n+1} = \frac{4a_n - 3}{3a_n - 2} \end{cases} \quad ; \quad n$$

$$b_n = \frac{1}{a_n - 1}$$

$$b_{n+1} - b_n = \frac{1}{a_{n+1} - 1} - \frac{1}{a_n - 1}$$

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

$$b_{n+1} - b_n = \frac{3a_n - 2}{4a_n - 3 - 3a_n + 2} - \frac{1}{a_n - 1} = \frac{3a_n - 2}{a_n - 1} - \frac{1}{a_n - 1}$$

$$b_{n+1} - b_n = \frac{3a_n - 2 - 1}{a_n - 1} = \frac{3a_n - 3}{a_n - 1}$$

$$b_{n+1} - b_n = \frac{3(a_n - 1)}{a_n - 1}$$

$$\boxed{b_{n+1} - b_n = 3}$$

(d = 3)

b_n ,

$$b_1 = 4, \quad d = 3 \quad ; \quad b_1 = \frac{1}{a_1 - 1} = \frac{1}{1.25 - 1} = \frac{1}{0.25} = 4$$

$$b_n = 4 + 3(n - 1) \rightarrow b_n = 3n + 1 \quad ; \quad b_1 = 4, \quad d = 3$$

$$b_n = \frac{1}{a_n - 1}$$

$$3n + 1 = \frac{1}{a_n - 1}$$

$$a_n - 1 = \frac{1}{3n + 1}$$

$$a_n = 1 + \frac{1}{3n + 1}$$

$$\boxed{a_n = \frac{3n + 2}{3n + 1}}$$

$$a_n = \frac{3n + 2}{3n + 1} :$$

$$a_n = 1 + \frac{1}{3n + 1}$$

a_n

-

, n ,

∴

$$a_n = \frac{3n + 2}{3n + 1} < 1.01$$

$$\frac{3n + 2}{3n + 1} < 1.01$$

$$3n + 2 < 1.01(3n + 1)$$

$$3n + 2 < 3.03n + 1.01$$

$$-0.03n < -0.99$$

$$n > 33$$

∴ $n = 34$:

' - C '

- B

- A

- \bar{G}

- G

$$P(A) = 0.3, \quad P(B) = 0.4 \quad \rightarrow \quad P(C) = 0.3$$

$$P(G/A) = \frac{1}{3} \quad \rightarrow \quad P(\bar{G}/A) = \frac{2}{3}$$

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

$$P(A/G) = 0.25$$

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

$$0.6 = \frac{P(G \cap B)}{0.4}$$

$$P(G \cap B) = 0.24$$

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

$$\frac{1}{3} = \frac{P(G \cap A)}{0.3}$$

$$P(G \cap A) = 0.1$$

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

$$0.25 = \frac{0.1}{P(G)}$$

$$P(G) = 0.4$$

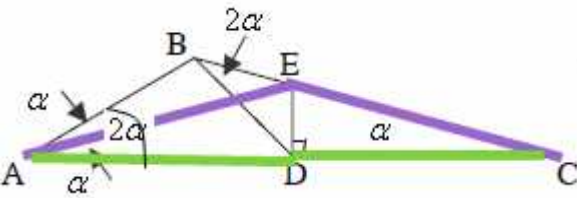
	' C	' B	' A	
0.4	0.06	0.24	0.1	- G
0.6	0.24	0.16	0.2	- \bar{G}
1	0.3	0.4	0.3	

60% :

16% .

$$P(G/C) = \frac{P(G \cap C)}{P(C)} = \frac{0.06}{0.3} = 0.2 = 20\%$$

20% :



$\sphericalangle CAB = \sphericalangle CBD = 2r$.3 $ED \perp AC$.2 $AD = CD$.1

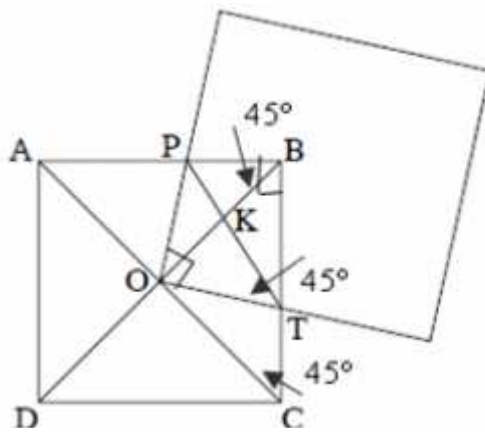
$\sphericalangle BCD = r$.4

$\sphericalangle BAE = r$. : "

r . $\triangle ABD \sim \triangle BED$ (2) $\frac{BE}{BD} = \frac{AB}{DC}$ (1) .

	$AD = CD$	5	1
	$ED \perp AC$	6	2
$\triangle AEC$	$AE = EC$	7	6,5
	$\sphericalangle BCD = r$	8	4
$\triangle AEC$	$\sphericalangle EAC = \sphericalangle ECA = r$	9	8,7
	$\sphericalangle CAB = \sphericalangle CBD = 2r$	10	3
	$\sphericalangle BAE = r$	11	10,9
. . .			
$\triangle AEC -$	$\sphericalangle AEB = 2r$	12	9,8
	() $\sphericalangle AEB = \sphericalangle CBD$	13	12,10
	() $\sphericalangle BAE = \sphericalangle BCD$	14	11,8
	$\triangle AEB \sim \triangle CBD$	15	14,13
	$\frac{BE}{BD} = \frac{AB}{DC}$	16	15
(1) . . .			
	$\frac{BE}{BD} = \frac{AB}{AD}$	17	14,5
	$\triangle ABD \sim \triangle BED$	18	15,10
(2) . . .			

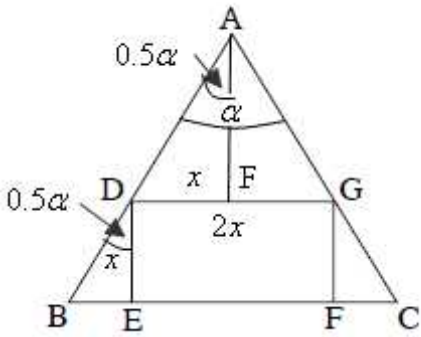
	$\sphericalangle BDA = \sphericalangle EDB = 0.5 \cdot \sphericalangle ADE = 0.5 \cdot 90^\circ = 45^\circ$	19	18,6
$\Delta BCD -$	$\sphericalangle BDA = \sphericalangle BCD + \sphericalangle CBD$	20	
	$\sphericalangle BDA = 3r$	21	10,8
	$r = 15^\circ$	22	21,19
. . .			



O .2 ABCD .1
 OTBP (1) . : "
 $\Delta POB \cong \Delta TOC$.

$\Delta PKB \sim \Delta OKT$ (2)

	ABCD	3	1
	$\sphericalangle ABC = 90^\circ$	4	3
	O	5	2
	$\sphericalangle POT = 90^\circ$	6	5
	$\sphericalangle POT + \sphericalangle PBT = 180^\circ$	7	6,4
$180^\circ -$	OTBP	8	7
(1) . . .			
(\widehat{PO})	() $\sphericalangle PBO = \sphericalangle PTO$	9	8
	() $\sphericalangle PKB = \sphericalangle OKT$	10	
	$\Delta PKB \sim \Delta OKT$	11	10,9
(2) . . .			
	$\sphericalangle PBO = 45^\circ$	12	4,3
	$\sphericalangle KTO = 45^\circ$	13	12,9
$180^\circ \Delta POT$	$\sphericalangle TPO = 45^\circ$	14	13,6
	$\sphericalangle TPO = \sphericalangle KTO$	15	14,13
ΔPOT	() $PO = TO$	16	15
	$\sphericalangle COB = 90^\circ$	17	3
	$\sphericalangle COB = \sphericalangle POT$	18	6,17
	$\sphericalangle POB = \sphericalangle POT - \sphericalangle BOT$ $\sphericalangle TOC = \sphericalangle BOC - \sphericalangle BOT$	19	
	() $\sphericalangle POB = \sphericalangle TOC$	20	19,18
	() $OC = OB$	21	3
	$\Delta POB \cong \Delta TOC$	22	21,20,16
. . .			



. () AF

. AF ⊥ DG - ,
 . DF = GF , ΔADG
 . ∠BDE = ∠DAF = 0.5r : DE ∥ AF
 . DG = 2DE = 2x, DF = x DE = x

ΔADF

$$\sin 0.5r = \frac{DF}{AD} \rightarrow AD = \frac{x}{\sin 0.5r}$$

ΔBDE

$$\cos 0.5r = \frac{DE}{BD} \rightarrow BD = \frac{x}{\cos 0.5r}$$

$$AB = \frac{x}{\sin 0.5r} + \frac{x}{\cos 0.5r}$$

$$AB = \frac{x \cos 0.5r + x \sin 0.5r}{\sin 0.5r \cos 0.5r}$$

$$AB = \frac{x(\cos 0.5r + \sin 0.5r)}{0.5 \sin r}$$

$$S_{\Delta ABC} = \frac{1}{2} \left(\frac{x(\cos 0.5r + \sin 0.5r)}{0.5 \sin r} \right)^2 \sin r$$

$$S_{\Delta ABC} = \frac{1}{2} \cdot \frac{x^2 (\cos^2 0.5r + 2 \cos 0.5r \sin 0.5r + \sin^2 0.5r)}{0.25 \sin^2 r} \cdot \sin r$$

$$S_{\Delta ABC} = \frac{x^2 (1 + \sin r)}{0.5 \sin r}$$

. ABC $\frac{3}{8}$ DEFG r

$$2x^2 = \frac{3}{8} \cdot \frac{x^2 (1 + \sin r)}{0.5 \sin r} \quad /: x^2 \neq 0$$

$$8 \sin r = 3 + 3 \sin r$$

$$5 \sin r = 3$$

$$\sin r = 0.6$$

$$\boxed{r = 36.87^\circ, \quad r = 143.13^\circ}$$

$$r = 36.87^\circ, \quad r = 143.13^\circ :$$

$$a > 0, \quad f(x) = \frac{4}{3}x^3 - a^2x + a^2$$

$$f(0) = \frac{4}{3} \cdot 0^3 - a^2 \cdot 0 + a^2 = a^2 \rightarrow \boxed{(0, a^2)} :$$

$$x = 0$$

$$y =$$

.

$$(0, a^2) :$$

(1)

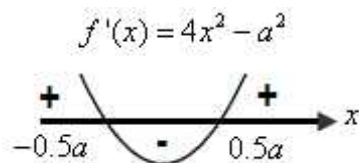
$$f(x) = \frac{4}{3}x^3 - a^2x + a^2$$

$$f'(x) = 4x^2 - a^2$$

$$0 = 4x^2 - a^2$$

$$4x^2 = a^2$$

$$x^2 = 0.25a^2$$



$$x = 0.5a \rightarrow f(0) = \frac{4}{3} \cdot (0.5a)^3 - a^2 \cdot 0.5a + a^2 = -\frac{a^3}{3} + a^2 \rightarrow \left(0.5a, a^2 - \frac{a^3}{3}\right)$$

$$x = -0.5a \rightarrow f(0) = \frac{4}{3} \cdot (-0.5a)^3 - a^2 \cdot (-0.5a) + a^2 = \frac{a^3}{3} + a^2 \rightarrow \left(-0.5a, a^2 + \frac{a^3}{3}\right)$$

$$x = 0.5a$$

$$\left(-0.5a, a^2 + \frac{a^3}{3}\right), \quad \left(0.5a, a^2 - \frac{a^3}{3}\right) :$$

$$, a > 0$$

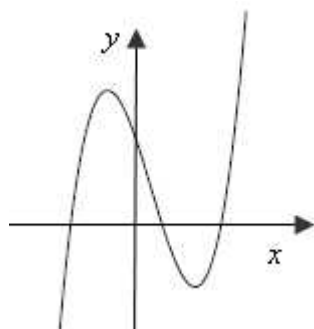
$$, a^2 + \frac{a^3}{3}$$

(2)

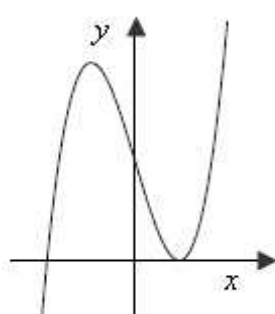
$$(-0.5a) x -$$

$$. f(x) = 0$$

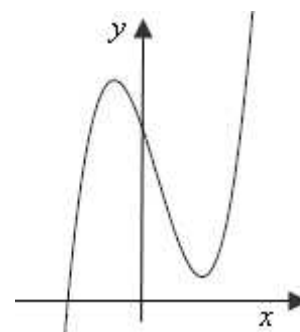
(3)



(2)



(1)



$$, a^2 - \frac{a^3}{3}$$

$$y - a$$

$$. f(x) = 0$$

$$. a > 0 \quad , 3 - a$$

$$y - , a^2 - \frac{a^3}{3} = \frac{3a^2 - a^3}{3} = \frac{a^2(3-a)}{3}$$

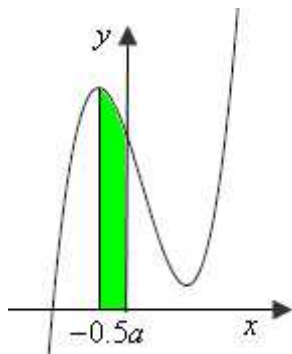
$$a = 3 : , y_{\text{Min}} = 0 , \quad (1)$$

$$0 < a < 3 : : a > 0 - a < 3 , y_{\text{Min}} > 0 , \quad (2)$$

$$. a > 3 : : , y_{\text{Min}} < 0 , \quad (3)$$

$$a > 0$$

a



$$S = \int_{-0.5a}^0 \left(\frac{4}{3}x^3 - a^2x + a^2 - 0 \right) dx$$

$$S = \left(\frac{x^4}{3} - \frac{a^2x^2}{2} + a^2x \right) \Big|_{-0.5a}^0$$

$$S = (0) - \left(\frac{(-0.5a)^4}{3} - \frac{a^2 \cdot (-0.5a)^2}{2} + a^2 \cdot (-0.5a) \right)$$

$$S = (0) - \left(\frac{a^4}{48} - \frac{a^4}{8} - \frac{a^3}{2} \right)$$

$$S = \frac{5a^4}{48} + \frac{a^3}{2}$$

$$\frac{a^3}{2} + \frac{80}{3}$$

$$\frac{5a^4}{48} + \frac{a^3}{2} = \frac{a^3}{2} + \frac{80}{3}$$

$$\frac{5a^4}{48} = \frac{80}{3}$$

$$a^4 = 256$$

$$a = 4 \leftarrow a > 0$$

$$. f(x) = 0$$

$$, a = 4 > 3 -$$

:

$$f(x) = \frac{16x-6}{\sqrt{4x^2-3x-1}}$$

0 -

$$x = 1, -0.25$$

$$, 4x^2 - 3x - 1 > 0$$

$$x < -0.25 \quad x > 1 : \quad :$$

$$x = 0 \quad y$$

$$x = \frac{3}{8} \quad x$$

$$f(x) = 2 \cdot \frac{8x-3}{\sqrt{4x^2-3x-1}}$$

$$f'(x) = 2 \cdot \frac{8\sqrt{4x^2-3x-1} - \frac{(8x-3)(8x-3)}{2\sqrt{4x^2-3x-1}}}{4x^2-3x-1}$$

$$f'(x) = 2 \cdot \frac{16(4x^2-3x-1) - (8x-3)^2}{2(4x^2-3x-1)\sqrt{4x^2-3x-1}}$$

$$f'(x) = \frac{64x^2 - 48x - 16 - (64x^2 - 48x + 9)}{(4x^2 - 3x - 1)\sqrt{4x^2 - 3x - 1}}$$

$$f'(x) = \frac{64x^2 - 48x - 16 - 64x^2 + 48x - 9}{(4x^2 - 3x - 1)\sqrt{4x^2 - 3x - 1}}$$

$$f'(x) = \frac{-25}{(4x^2 - 3x - 1)\sqrt{4x^2 - 3x - 1}}$$

$$x < -0.25 \quad x > 1$$

$$x : \quad , x < -0.25 \quad x > 1 : \quad :$$

$$f(x) = \frac{16x-6}{\sqrt{4x^2-3x-1}} = \frac{16x-6}{|x|\sqrt{4-\frac{3}{x}-\frac{1}{x^2}}}$$

$$\lim_{x \rightarrow +\infty} \frac{16x-6}{|x|\sqrt{4-\frac{3}{x}-\frac{1}{x^2}}} = \lim_{x \rightarrow +\infty} \frac{16x-6}{x\sqrt{4-\frac{3}{x}-\frac{1}{x^2}}} = \frac{16}{2} \rightarrow \boxed{y=8}$$

$$\lim_{x \rightarrow -\infty} \frac{16x-6}{|x|\sqrt{4-\frac{3}{x}-\frac{1}{x^2}}} = \lim_{x \rightarrow -\infty} \frac{16x-6}{-x\sqrt{4-\frac{3}{x}-\frac{1}{x^2}}} = \frac{16}{-2} \rightarrow \boxed{y=-8}$$

$$\lim_{x \rightarrow 1^+} \frac{16x-6}{\sqrt{4x^2-3x-1}} = \lim_{x \rightarrow 1^+} \frac{10}{0^+} = +\infty \rightarrow \boxed{x=1}$$

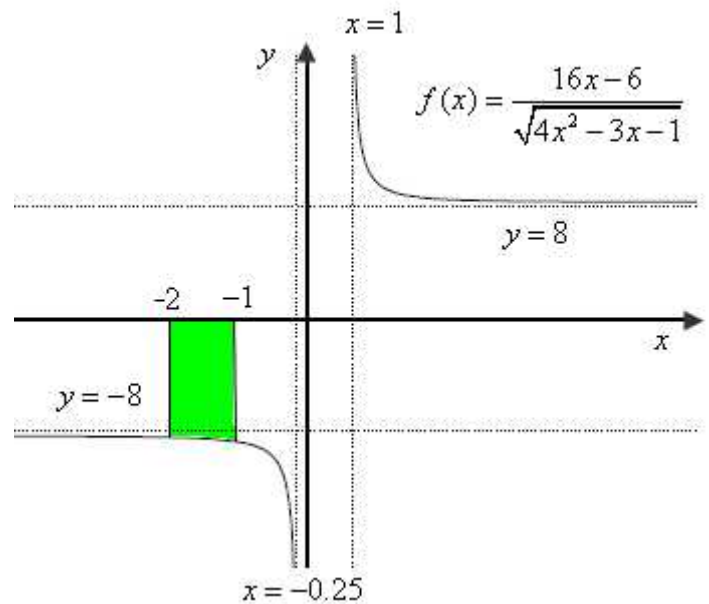
$$\lim_{x \rightarrow -0.25^-} \frac{16x-6}{\sqrt{x^2-15}} = \lim_{x \rightarrow -0.25^-} \frac{-70}{0^+} = -\infty \rightarrow \boxed{x=-0.25}$$

$x = -0.25, x = 1$:

$y = -8, y = 8$:

$x < -0.25$ $x > 1$

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$$f(x) = \frac{16x-6}{\sqrt{4x^2-3x-1}}$$

$$2 \quad f(x)$$

$$\int \frac{16x-6}{\sqrt{4x^2-3x-1}} dx = 2 \cdot 2\sqrt{4x^2-3x-1} + c = 4\sqrt{4x^2-3x-1} :$$

$$S = \int_{-2}^{-1} \left(0 - \frac{16x-6}{\sqrt{4x^2-3x-1}}\right) dx$$

$$S = (-4\sqrt{4x^2-3x-1}) \Big|_{-2}^{-1}$$

$$S = (-4\sqrt{4 \cdot (-1)^2 - 3 \cdot (-1) - 1}) - (-4\sqrt{4 \cdot (-2)^2 - 3 \cdot (-2) - 1})$$

$$S = -4\sqrt{6} - (-4\sqrt{21})$$

$$\boxed{S = 4(\sqrt{21} - \sqrt{6})}$$

$$. \quad " \quad 4(\sqrt{21} - \sqrt{6}) = 8.532 \quad :$$

$$.0 \leq x \leq \frac{f}{4} \quad f(x) = \frac{3}{2} \cos(2x) + \frac{1}{4} \sin(4x) :$$

$$0 \leq x \leq \frac{f}{2} \quad \cos r \geq 0 \quad , \quad \cos 2x \geq 0$$

$$.0 \leq x \leq f \quad \sin r \geq 0 \quad , \quad \sin 4x \geq 0$$

$$. f(x) \geq 0 \quad , \quad - \quad f(x)$$

. :

$$.0 \leq x \leq \frac{f}{4} \quad , A(t, \frac{3}{2} \cos 2t + \frac{1}{4} \sin 4t)$$

מינימום סכום המרחקים של הנקודה A מהצירים,

$$\boxed{f(t) = t + \frac{3}{2} \cos 2t + \frac{1}{4} \sin 4t}$$

:

$$f(0) = 0 + \frac{3}{2} \cos(2 \cdot 0) + \frac{1}{4} \sin(4 \cdot 0) = 1.5 \rightarrow (0, 1.5)$$

$$f\left(\frac{f}{4}\right) = \frac{f}{4} + \frac{3}{2} \cos\left(2 \cdot \frac{f}{4}\right) + \frac{1}{4} \sin\left(4 \cdot \frac{f}{4}\right) = 0 \rightarrow \left(\frac{f}{4}, \frac{f}{4}\right)$$

$$\left(\frac{f}{4}, \frac{f}{4}\right), (0, 1.5) :$$

$$f'(t) = 1 - 3\sin 2t + \cos 4t$$

$$0 = 1 - 3\sin 2t + \cos 4t$$

$$0 = 1 - 3\sin 2t + 1 - 2\sin^2 2t \quad \leftarrow \cos 2x = 1 - 2\sin^2 2x$$

$$2\sin^2 2t + 3\sin 2t - 2 = 0$$

$$(\sin 2t)_{1,2} = \frac{-3 \pm 5}{4}$$

$$\sin 2t = 0.5 = \sin \frac{f}{6} \quad \sin 2x = -2 \quad \leftarrow -1 \leq \sin x \leq 1$$

$$2x = \frac{f}{6} + 2fk \quad 2x = \frac{5f}{6} + 2fk$$

$$x = \frac{f}{12} + 2fk \quad x = \frac{5f}{12} + fk$$

$$k = 0 \rightarrow x = \frac{f}{12}$$

$$f\left(\frac{f}{12}\right) = \frac{f}{12} + \frac{3}{2} \cos\left(2 \cdot \frac{f}{12}\right) + \frac{1}{4} \sin\left(4 \cdot \frac{f}{12}\right)$$

$$= \frac{f}{12} + \frac{3}{2} \cdot \frac{\sqrt{3}}{2} + \frac{1}{4} \cdot \frac{\sqrt{3}}{2} = \frac{f}{12} + \frac{7\sqrt{3}}{8} \rightarrow \left(\frac{f}{12}, \frac{f}{12} + \frac{7\sqrt{3}}{8}\right) = \left(\frac{f}{12}, 1.778\right)$$

$$\left(\frac{f}{12}, 1.778\right)$$

0		$\frac{f}{12}$		$\frac{f}{4}$	x
1.5		1.778		$\frac{f}{4}$	$f(x)$
					$f'(x)$
Min	↘	Max	↘	Min	

$$\cdot 1.778$$

$$\cdot 1.778$$

A

:

$$\cdot \frac{f}{4} = 0.7854$$

$$\cdot \frac{f}{4} = 0.7854$$

A

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