

.I

III

x - .

$$\frac{20}{60} = \frac{1}{3}$$

(") III

y -

.II

III

, x+1

:

s - "	v - "	t -		
$6(x + \frac{1}{3}) = 6x + 2$	6	$x + \frac{1}{3}$	I	.I III
xy	y	x	III	
$7.5(x + \frac{4}{3}) = 7.5x + 10$	7.5	$x + 1 + \frac{1}{3} = x + \frac{4}{3}$	II	.II III
(x+1)y	y	x+1	III	

$$:(y > 0) \begin{cases} xy = 6x + 2 \\ (x+1)y = 7.5x + 10 \end{cases}$$

$$\frac{x}{x+1} = \frac{6x+2}{7.5x+10} \quad / \cdot (x+1)(7.5x+10)$$

$$x(7.5x+10) = (x+1)(6x+2)$$

$$7.5x^2 + 10x = 6x^2 + 2x + 6x + 2$$

$$1.5x^2 + 2x - 2 = 0$$

$$x_{1,2} = \frac{-2 \pm 4}{3}$$

$$\boxed{x = \frac{2}{3}} \quad \leftarrow x > 0$$

40

, $\frac{2}{3}$

I

III

II

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

$$a_n, a_{n+1}, a_{n+2}$$

$$(a_{n+2})^2 - (a_n)^2 = 216$$

$$a_n + a_{n+1} + a_{n+2} = 54$$

$$a_{n+1} = 18$$

$$a_{n+1} - d + a_{n+1} + a_{n+1} + d = 54$$

$$3a_{n+1} = 54 \quad /:3$$

$$a_{n+1} = 18$$

$$18 - d, 18, 18 + d$$

$$(18 + d)^2 - (18 - d)^2 = 216$$

$$324 + 36d + d^2 - 324 + 36d - d^2 = 216$$

$$72d = 216 \quad /:72$$

$$\boxed{d = 3}$$

$$\boxed{a_n = 15} \leftarrow a_n = 18 - 3$$

$$a_n = 15$$

$$a_5, a_9, a_{13}, \dots, a_{4k+1}$$

$$12$$

$$a_9 - a_5 = a_5 + 4d - a_5 = 4d = 4 \cdot 3 = 12$$

$$5, 9, 13, \dots, 4k+1$$

$$e$$

$$4$$

$$5$$

$$4k + 1 = 5 + 4(e - 1)$$

$$4k + 1 = 5 + 4e - 4$$

$$k = e$$

$$k$$

$$a_5 = a_1 + 4d = -21 + 12 = -9$$

$$S_k = 450$$

$$\frac{k[2 \cdot (-9) + 12(k - 1)]}{2} = 450 \quad /:2$$

$$k(-18 + 12k - 12) = 900$$

$$12k^2 - 30k - 900 = 0$$

$$k_{1,2} = \frac{30 \pm 210}{24}$$

$$\boxed{k = 10} \quad 4 \cdot 10 + 1 = 41 \quad o.k.$$

$$k = -7.5 \quad 4 \cdot (-7.5) + 1 = -29 \quad false$$

$$k = 10$$

$$\begin{matrix} \bar{A} & - & A \\ \bar{B} & - & B \end{matrix}$$

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

$$P(\bar{A}/B) = 0.1 \rightarrow P(A/B) = 0.9$$

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

$$P(B) = 0.4 \quad P(\bar{A}/B) = 0.1,$$

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

$$0.1 = \frac{P(\bar{A} \cap B)}{0.4}$$

$$P(\bar{A} \cap B) = 0.04 \rightarrow P(A \cap B) = 0.36$$

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

$$0.75 = \frac{0.36}{P(A)}$$

$$P(A) = 0.48$$

	\bar{A}	A	
0.4	0.04	0.36	B
0.6	0.48	0.12	\bar{B}
1	0.52	0.48	

$$0.48 \quad , \quad , \quad , \quad :$$

$$() B - () A$$

$$P(B) = 0.4 \quad , P(B/A) = 0.75$$

$$P(B) \neq P(B/A) :$$

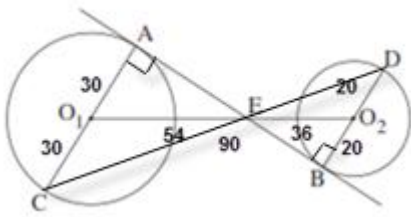
$$1 - 0.99 = 0.01$$

$$0.1^n \quad , \quad n \quad , \quad P(\bar{A}/B) = 0.1$$

$$n = 2 \quad 0.1^n = 0.01$$

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O_2

BD .2 O_1

AC .1

O_1EO_2 .4

AEB .3

$O_1EO_2 = \text{" } 90$.7 $R_{O_2} = \text{" } 20$.6 $R_{O_1} = \text{" } 30$.5

CD

E . $\triangle EO_1C \sim \triangle EO_2D$ (2) $\frac{O_1E}{O_1C}$ (1) . : "

(' DEC , AEB - O_1EO_2 :)

	O_1	AC	8	1
		$\sphericalangle O_1AE = 90^\circ$	9	8
	O_2	BD	10	2
		$\sphericalangle O_2BE = 90^\circ$	11	10
, (AB)		$AO_1 \parallel BO_2$	12	11, 9
		$R_{O_1} = \text{" } 30$	13	5
		$R_{O_2} = \text{" } 20$	14	6
, 2		$\frac{O_1E}{O_2E} = \frac{AO_1}{BO_2} = \frac{3}{2}$	15	14, 13, 12
		$O_1E = \frac{3}{5} O_1EO_2$	16	15
		$O_1EO_2 = \text{" } 90$	17	7
		$O_1E = \text{" } 54$	18	17, 16
		$\frac{O_1E}{O_1C} = \frac{54}{30} = \frac{9}{5}$	19	18, 13
(1) . . .				
		$\frac{O_1C}{O_2D} = \frac{3}{2}$	20	14, 13
		$\frac{O_1E}{O_2E} = \frac{O_1C}{O_2D}$	21	20, 15
		$\sphericalangle EO_1C = \sphericalangle EO_2D$	22	12
		$\triangle EO_1C \sim \triangle EO_2D$	23	21, 22
(2) . . .				

	$\sphericalangle\text{DEO}_2 = \sphericalangle\text{CEO}_1$	24	23
180° (17)	$\sphericalangle\text{O}_1\text{ED} = 180^\circ - \sphericalangle\text{DEO}_2$	25	17
	$\sphericalangle\text{O}_1\text{ED} + \sphericalangle\text{CEO}_1 = 180^\circ$	26	24, 25
$\sphericalangle\text{CED}$	CD E	27	26
. . .			

.GB ,

, ($\sphericalangle GCB = 90^\circ$)

$\triangle CGB$.

. $AC = 2x$ AC G . () $GC = BC = x$

$\triangle CGB$

$$x^2 + x^2 = (2R)^2$$

$$2x^2 = 4R^2$$

$$\boxed{x = R\sqrt{2}}$$

$\triangle ACB$

$$x^2 + (2x)^2 = (AB)^2$$

$$5x^2 = (AB)^2$$

$$5(R\sqrt{2})^2 = (AB)^2$$

$$10R^2 = (AB)^2$$

$$AB = R\sqrt{10}$$

$$\boxed{R_{\triangle ACB} = \frac{R\sqrt{10}}{2}}$$

$$. R_{\triangle ACB} = \frac{R\sqrt{10}}{2} :$$

. AB , $\triangle ACB$

M , PM .

$$. MB = R_{\triangle ACB} = \frac{R\sqrt{10}}{2}$$

$$BG = 4PG \rightarrow BP = \frac{3}{4}GB = 1.5R$$

$\triangle ACB$

$$\tan \sphericalangle ABC = \frac{AC}{BC} = \frac{2x}{x}$$

$$\boxed{\sphericalangle ABC = 63.43^\circ}$$

$$\sphericalangle PBM = 63.43^\circ - 45^\circ$$

$$\boxed{\sphericalangle PBM = 18.43^\circ}$$

$\triangle PMB$

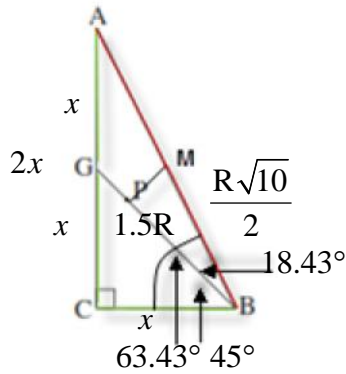
$$(PM)^2 = (MB)^2 + (BP)^2 - 2MB \cdot BP \cdot \cos \sphericalangle PBM$$

$$(PM)^2 = \left(\frac{R\sqrt{10}}{2}\right)^2 + (1.5R)^2 - 2 \cdot \frac{R\sqrt{10}}{2} \cdot 1.5R \cdot \cos 18.43^\circ$$

$$(PM)^2 = 0.25R^2$$

$$\boxed{PM = 0.5R} \leftarrow PM > 0$$

$$. 0.5R :$$



$$g(x) = \sqrt{8x^2 - x^4} \quad f(x) = x\sqrt{8 - x^2}$$

$$g(x) = |x|\sqrt{8 - x^2} = |f(x)| :$$

$$g(x) = -f(x) \quad x < 0 \quad , \quad g(x) = f(x) \quad x > 0 \quad :$$

$$8 - x^2 \geq 0 \quad , \quad (1)$$

$$(-\sqrt{8}, 0), (\sqrt{8}, 0) \quad , \quad 8 - x^2$$

$$(-2\sqrt{2} \leq x \leq 2\sqrt{2}) \quad -\sqrt{8} \leq x \leq \sqrt{8} :$$

$$-2\sqrt{2} \leq x \leq 2\sqrt{2} \quad :$$

$$g(x) \quad , \quad x \quad - \quad f(x) = x\sqrt{8 - x^2} \quad (2)$$

$$(0, 0), (-2\sqrt{2}, 0), (2\sqrt{2}, 0) \quad , \quad 0 = x\sqrt{8 - x^2}$$

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

$$, \quad f(x) = x\sqrt{8 - x^2}$$

!!!

$$g(x) = |f(x)|$$

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

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

$$\boxed{f'(x) = \frac{8 - 2x^2}{\sqrt{8 - x^2}}}$$

$$0 = 8 - 2x^2$$

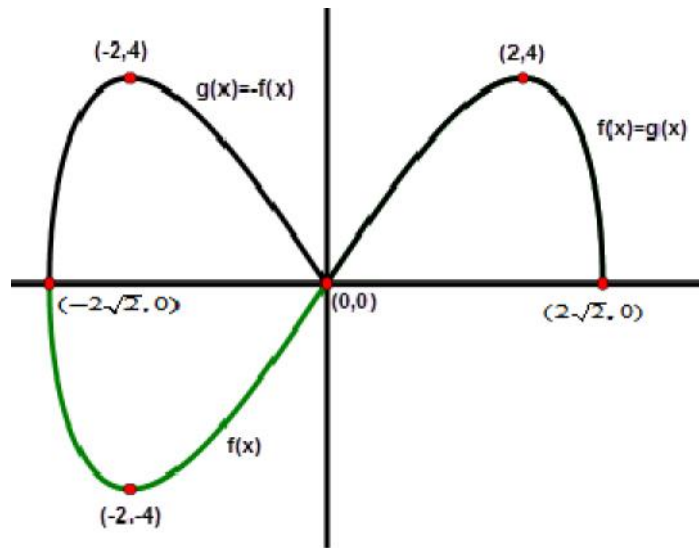
$$x = 2 \rightarrow y = 4 \rightarrow (2, 4)$$

$$x = -2 \rightarrow y = -4 \rightarrow (-2, -4)$$

, , y -

$$(2\sqrt{2}, 0) \quad , \quad (-2, -4) \quad , \quad (2, 4) \quad , \quad (-2\sqrt{2}, 0) :$$

$$g(x) = |f(x)| \quad f(x)$$



$g(x)$

$(-2\sqrt{2}, 0)$, $(-2, 4)$, $(0, 0)$, $(2, -4)$, $(2, 4)$, $(2\sqrt{2}, 0)$: $f(x)$:
 $(-2\sqrt{2}, 0)$, $(-2, 4)$, $(0, 0)$, $(2, 4)$, $(2\sqrt{2}, 0)$: $g(x)$

$g(x)$

$f(x)$

$(0, \sqrt{8})$

$x = 0$

$$f'(0) = \frac{8 - 2 \cdot 0^2}{\sqrt{8 - 0^2}} = \sqrt{8}$$

$(0, -\sqrt{8})$

$g'(x) = -f'(x)$

$y -$

$f(x)$

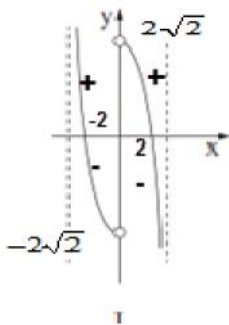
$x = \pm 2\sqrt{2}$

$g(x)$

/

$g'(x)$

/



$$g'(x) = \frac{16x - 4x^3}{2\sqrt{8x^2 - x^4}} = \frac{8x - 2x^3}{\sqrt{8x^2 - x^4}} : g'(x)$$

$g'(0.1) = 2.828 \approx \sqrt{8}, g'(-0.1) = 2.828 \approx -\sqrt{8}$

$x = 0 -$

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$$a > 0, f(x) = \frac{(x-2)^2}{x^2-1} \tag{1}$$

$x \neq \pm 1$

$x = \pm 1$

$x \neq \pm 1 :$

$$y = 1, \lim_{x \rightarrow \infty} \frac{(x-2)^2}{x^2-1} = \lim_{x \rightarrow \infty} \frac{1 - \frac{2}{x} + \frac{4}{x^2}}{1 - \frac{1}{x^2}} = \lim_{x \rightarrow \infty} \frac{1-0+0}{1-0} = 1 \tag{2}$$

$$x = 1, x = -1, \lim_{x \rightarrow 1^+} \frac{(x-2)^2}{x^2-1} = \frac{1}{0^+} = +\infty, \lim_{x \rightarrow 1^-} \frac{(x-2)^2}{x^2-1} = \frac{1}{0^-} = -\infty$$

$$\lim_{x \rightarrow -1^+} \frac{(x-2)^2}{x^2-1} = \frac{1}{0^+} = +\infty, \lim_{x \rightarrow -1^-} \frac{(x-2)^2}{x^2-1} = \frac{1}{0^-} = -\infty$$

$x = 1, x = -1,$

$y = 1 :$

$x -$

(3)

$$0 = \frac{(x-2)^2}{x^2-1} \cdot (x^2-1)$$

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

$$x = 2 \rightarrow (2, 0)$$

$$f(0) = \frac{(0-2)^2}{0^2-1} = \frac{4}{-1} = -4 \rightarrow (0, -4) : y -$$

$(2, 0), (0, -4) :$

(4)

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

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

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

$$x-2=0 \rightarrow x=2 \rightarrow (2, 0)$$

$$2x-1=0 \rightarrow x=0.5 \rightarrow (0.5, -3)$$

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$$(x-2)(2x-1)$$

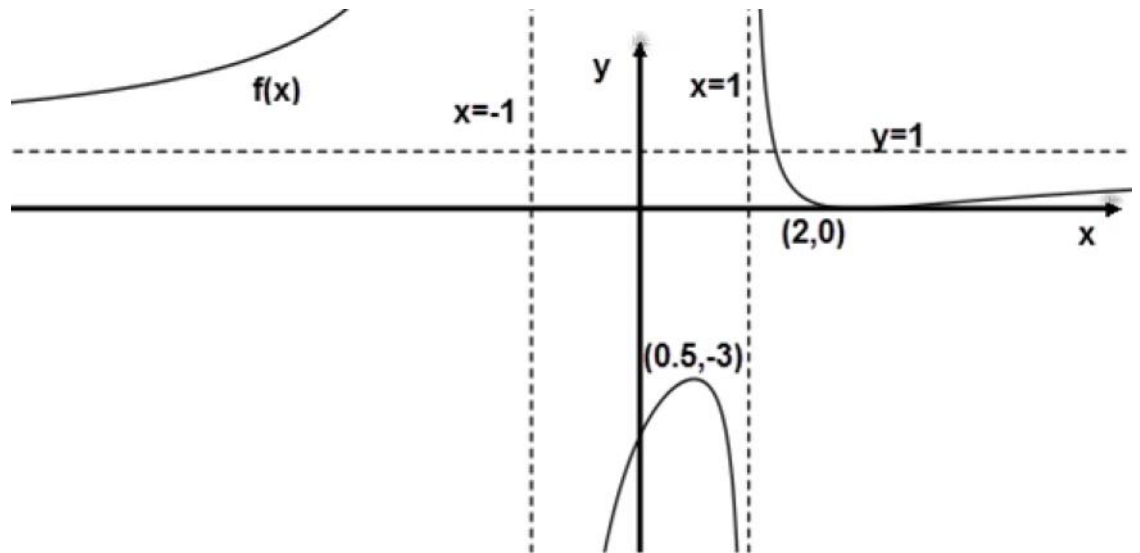
$$(0.5, -3) - x = 0.5$$

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

$(2, 0),$

$(0.5, -3) :$

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, $f(x)$, $f'(x)$.

. x -

. $0.5 < x < 1$ $1 < x < 2$:

. \cup

$f(x)$

, $f''(x)$

. $x < -1$, $(2, 0)$

x - x_1) $1 < x < x_1$:

. $1 < x < 2$

. $1 < x < 2$:

$S(x) = S_{ABCD}$ *שטח המלבן מקסימום*

$$\cdot MB = MD = R$$

ΔMBC

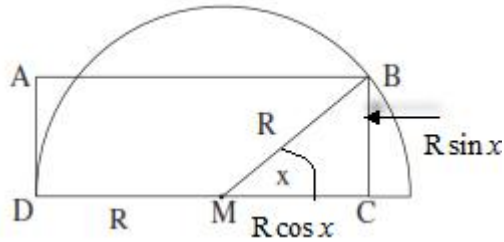
$$\cos x = \frac{MC}{MB}$$

$$\boxed{R \cos x = MC}$$

ΔMBC

$$\sin x = \frac{BC}{MB}$$

$$\boxed{R \sin x = BC}$$



$$S(x) = BC \cdot DC$$

$$S(x) = R \sin x \cdot (R + R \cos x)$$

$$S(x) = R^2 \sin x \cdot (1 + \cos x)$$

$$S(x) = R^2 (\sin x + \sin x \cos x)$$

$$\boxed{S(x) = R^2 (\sin x + 0.5 \sin 2x)}$$

$$S'(x) = R^2 [\cos x + \cos 2x]$$

$$\cos x + \cos 2x = 0$$

$$2 \cos (1.5x) \cos (-0.5x) = 0$$

$$2 \cos (1.5x) \cos (0.5x) = 0$$

$$\cos x(1.5x) = 0 \rightarrow 1.5x = \frac{f}{2} + fk \rightarrow \boxed{x = \frac{f}{3} + \frac{2}{3}fk}$$

$$\cos x(0.5x) = 0 \rightarrow 0.5x = \frac{f}{2} + fk \rightarrow x = f + 2fk$$

$$\cdot 0 < x < \frac{f}{2} \qquad x = \frac{f}{3}$$

$$S''(x) = R^2 (-\sin x - 2 \sin 2x)$$

$$S''\left(\frac{f}{3}\right) = R^2 \left(-\sin \frac{f}{3} - 2 \sin 2 \cdot \frac{f}{3}\right) = -2.6 < 0 \rightarrow \text{Max}$$

$$\cdot x = \frac{f}{3}, \text{Max} :$$

$$S(x) = R^2 \sin x \cdot (1 + \cos x) .$$

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

S(x)

, x

- S(x)

$$s\left(\frac{f}{2}\right) = R^2 , s(0) = 0$$

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

$$\int_0^{\frac{f}{2}} R^2 (\sin x + \sin x \cos x) dx =$$

$$\int_0^{\frac{f}{2}} R^2 \left(\sin x + \frac{1}{2} \sin 2x \right) dx = \leftarrow \sin 2x = 2 \sin x \cos x$$

$$R^2 \left(-\cos x - \frac{\cos 2x}{4} \right) \Bigg|_0^{\frac{f}{2}} =$$

$$x = \frac{f}{2}: R^2 \left(-\cos \frac{f}{2} - \frac{\cos 2 \cdot \frac{f}{2}}{4} \right) = R^2 (0 - (-0.25)) = 0.25R^2$$

$$x = 0: R^2 \left(-\cos 0 - \frac{\cos 2 \cdot \frac{0}{2}}{4} \right) = R^2 (-1 - 0.25) = -1.25R^2$$

$$\boxed{S = 1.5R^2}$$

$$.1.5R^2$$

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