

.() $AD = BC$, $AB \parallel DC$, $ABCD$.

() $\sphericalangle ABC = 120^\circ$, () $h = 3\sqrt{3}$, () $AB = 4$

.,() $BC = EC$,() $AD = BC$, $AB \parallel DC$, $ABCD$

.($180^\circ -$

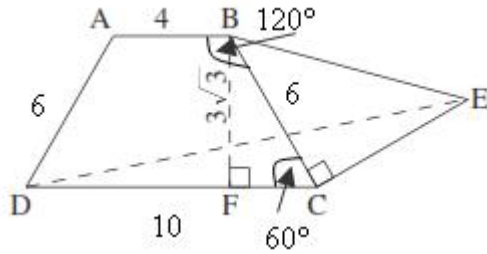
) $\sphericalangle BCF = 60^\circ$. BF (1)

($\sphericalangle F = 90^\circ$,) $\triangle BCF$

$$\sin \sphericalangle BCF = \frac{BF}{BC}$$

$$BC = \frac{3\sqrt{3}}{\sin 60^\circ}$$

$$\boxed{BC = 6}$$



. " 6

. $EC = BC = 6$ (2)

, $DC = AB + 2CF$

($\sphericalangle F = 90^\circ$,) $\triangle BCF$

$$\tan \sphericalangle BCF = \frac{BF}{CF}$$

$$CF = \frac{3\sqrt{3}}{\tan 60^\circ}$$

$$\boxed{CF = 3}$$

$\sphericalangle DCE = 60^\circ + 90^\circ = 150^\circ$, $DC = 10$:

, DE

$$(DE)^2 = (DC)^2 + (CE)^2 - 2DC \cdot CE \cdot \cos \sphericalangle DCE$$

$$(DE)^2 = 10^2 + 6^2 - 2 \cdot 10 \cdot 6 \cdot \cos 150^\circ$$

$$(DE)^2 = 239.92$$

$$\boxed{DE = 15.49}$$

. $DE = 15.49$:

.(ΔBCE ,

) $\sphericalangle BEC = 45^\circ$, $\sphericalangle BED = \sphericalangle BEC - \sphericalangle DEC$.

ΔDCE

$$\frac{DE}{\sin \sphericalangle DCB} = \frac{DC}{\sin \sphericalangle DEC}$$
$$\sin \sphericalangle DEC = \frac{10 \sin 150^\circ}{15.49}$$

$$\boxed{\sphericalangle DEC = 18.83^\circ} \quad \leftarrow 0 < \sphericalangle DEC < 90^\circ$$

$$\sphericalangle BED = 45^\circ - 18.83^\circ = 26.17^\circ$$

$$\therefore \sphericalangle BED = 26.17^\circ :$$

$0 \leq x \leq 2f \quad f(x) = x + \cos x$

$f(0) = 0 + \cos 0 = 1 \rightarrow (0, 1)$

$f(2f) = 2f + \cos(2f) = 2f + 1 \rightarrow (2f, 2f + 1)$

$f'(x) = 1 - \sin x$

$0 = 1 - \sin x$

$\sin x = 1$

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

$k = 0 \rightarrow x = \frac{f}{2} \rightarrow f\left(\frac{f}{2}\right) = \frac{f}{2} + \cos \frac{f}{2} = 1 \rightarrow \left(\frac{f}{2}, \frac{f}{2}\right)$

x	0		$\frac{f}{2}$		$2f$
y	1		$\frac{f}{2} = 1.57$		$2f + 1 = 7.28$
	Min	↘		↗	Max

$(2f, 2f + 1),$

$(0, 1) :$

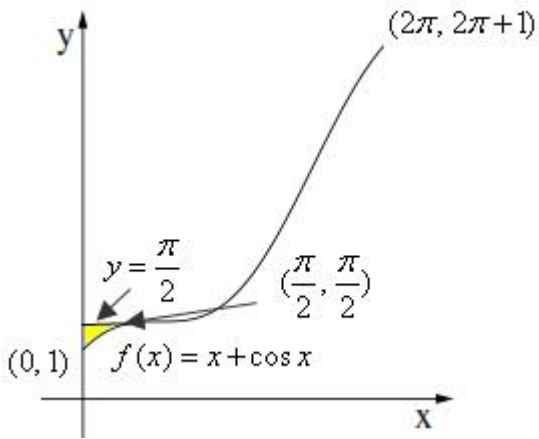
$y = \frac{f}{2}$

$x -$

0

$y = \frac{f}{2}$

:



$$S = \int_0^{\frac{f}{2}} \left(\frac{f}{2} - (x + \cos x) \right) dx + \int_0^{\frac{f}{2}} \left(\frac{f}{2} - x - \cos x \right) dx$$

$$S = \left(\frac{f}{2}x - \frac{x^2}{2} - \sin x \right) \Big|_0^{\frac{f}{2}}$$

$$S = \left(\frac{f}{2} \cdot \frac{f}{2} - \frac{\left(\frac{f}{2}\right)^2}{2} - \sin \frac{f}{2} \right) + \left(\frac{f}{2} \cdot 0 - \frac{(0)^2}{2} - \sin 0 \right)$$

$$\boxed{S = \frac{f^2}{8} - 1}$$

$$= 0.234 \frac{f^2}{8} - 1$$

$$f(x) = \frac{3x^2 - 8x}{e^x}$$

x

:

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

$$(0, 0), (2\frac{2}{3}, 0) \quad 3x^2 - 8 = 0 \quad y=0 \quad x-$$

$$(2\frac{2}{3}, 0), (0, 0) :$$

:

$$f(x) = \frac{3x^2 - 8x}{e^x}$$

$$f'(x) = \frac{(6x-8)e^x - (3x^2-8x)e^x}{e^{2x}}$$

$$f'(x) = \frac{e^x(6x-8-3x^2+8x)}{e^{2x}}$$

$$f'(x) = \frac{e^x(-3x^2+14x-8)}{e^{2x}}$$

$$0 = -3x^2 + 14x - 8$$

$$x_{1,2} = \frac{-14 \pm 10}{-6}$$

$$x = \frac{2}{3} \rightarrow y = \frac{3 \cdot (\frac{2}{3})^2 - 8 \cdot (\frac{2}{3})}{e^{(\frac{2}{3})}} \rightarrow (\frac{2}{3}, -2.054)$$

$$x = 4 \rightarrow y = \frac{3 \cdot 4^2 - 8 \cdot 4}{e^4} \rightarrow (4, 0.293)$$

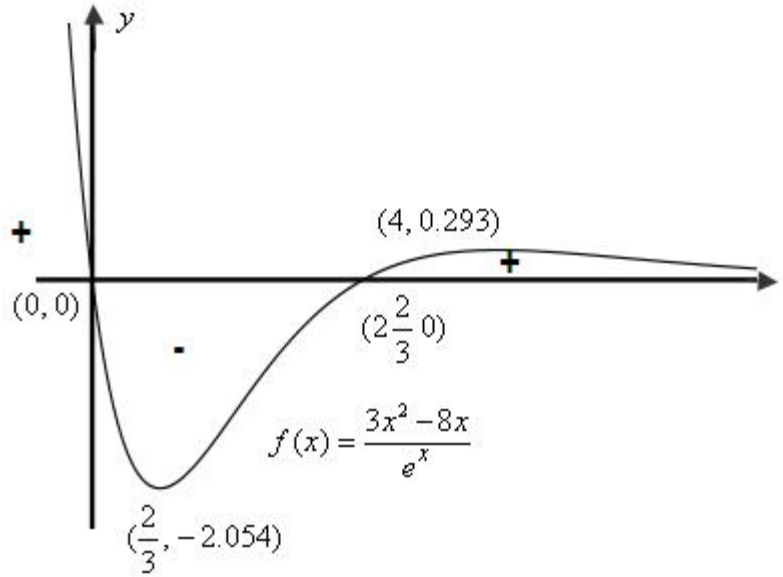
(e^x)

$$f'(0) = -3 \cdot 0^2 + 14 \cdot 0 - 8 < 0, \quad f'(1) = -3 \cdot 1^2 + 14 \cdot 1 - 8 > 0, \quad f'(5) = -3 \cdot 5^2 + 14 \cdot 5 - 8 < 0$$

0	$\frac{2}{3}$	1	4	5	x
-	0	+	0	-	y'
↘	Min	↗	Max	↘	

$$(\frac{2}{3}, -2.054), \quad (4, 0.293) :$$

"



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

$$0 < x < 2\frac{2}{3}$$

$$x < 0$$

$$x > 2\frac{2}{3}$$

$$g'(x) > 0$$

$$f(x)$$

$$x = 0$$

$$g(x)$$

$$x = 0$$

$$g'(x)$$

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

$$g(x)$$

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

$$g'(x)$$

$$x = 2\frac{2}{3}, x = 0 :$$

$x > 1 \quad f(x) = \frac{3}{x-1}$

$x = 1$, $x = 1$

(1)

$x < 1 \quad g(x) = \frac{1}{1-x}$

$x = 1$, $x = 1$

(1)

$y = 0, x = 1 : g(x)$, $y = 0, x = 1 : f(x)$:

$x = 0$, $g(x) = \frac{1}{1-x}$

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

$g'(0) = 1, g(0) = 1$

$y - 1 = 1(x - 0) \rightarrow \boxed{y = x + 1}$

$f(x) = \frac{3}{x-1}$

$x + 1 = \frac{3}{x-1} \rightarrow x^2 - 1 = 3$

$x^2 = 4 \rightarrow x = 2 \leftarrow x > 1$

$2 + 1 = 3 \rightarrow (2, 3)$

$(2, 3)$:

$S_2 - S_1 : , 7.5$

$(\Delta ABC) S_1$

$S_1 = \frac{3 \cdot 3}{2} = 4.5$, $x = -1 \quad 0 = x + 1$

$S_2 = \int_2^a (\frac{3}{x-1} - 0) dx = 3 \ln|x-1| \Big|_2^a$

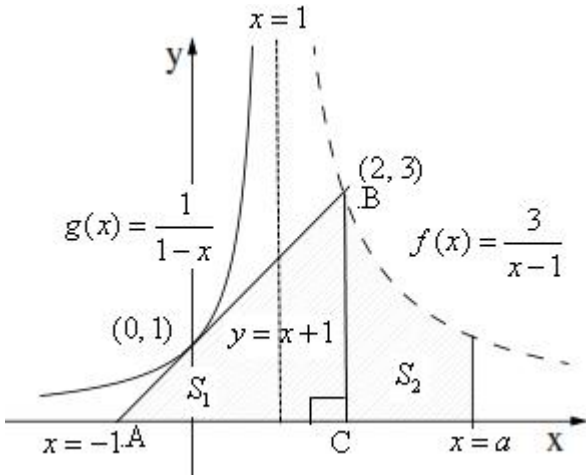
$S_2 = 3 \ln|a-1| - 3 \ln|2-1| = 3 \ln|a-1|$

$(\ln|a-1| = \ln(a-1))$, $(x=1 \quad x=a \quad a > 1)$

$\boxed{a = e + 1} \leftarrow a - 1 = e - \ln(a - 1) = 1 \quad 3 \ln(a - 1) + 4.5 = 7.5$:

$a = e + 1 :$

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$$f(x) = 4x + x\sqrt{4-x^2}$$

$$-2 \leq x \leq 2$$

$$(x-2)(x+2) \geq 0 \leftarrow 4-x^2 \geq 0$$

$$-2 \leq x \leq 2$$

$$f(2) = 4 \cdot 2 + 2\sqrt{4-2^2} = 8 \rightarrow (2, 8)$$

$$f(-2) = 4 \cdot (-2) + 2\sqrt{4-(-2)^2} = -8 \rightarrow (-2, -8)$$

$$(-2, -8), (2, 8)$$

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

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

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

$$0 = 4\sqrt{4-x^2} + 4 - 2x^2 \quad \boxed{x^2 = t}$$

$$0 = 4\sqrt{4-t} + 4 - 2t$$

$$2t - 4 = 4\sqrt{4-t} \quad /: 2$$

$$t - 2 = 2\sqrt{4-t}$$

$$(t-2)^2 = (2\sqrt{4-t})^2$$

$$t^2 - 4t + 4 = 4(4-t)$$

$$t^2 - 4t + 4 = 16 - 4t$$

$$t^2 = 12$$

$$t = \sqrt{12} \rightarrow \sqrt{12} - 2 = 2\sqrt{4-\sqrt{12}} \rightarrow 1.464 = 1.464 \text{ o.k.}$$

$$t = -\sqrt{12} \rightarrow -\sqrt{12} - 2 = 2\sqrt{4-\sqrt{12}} \rightarrow - = + \text{ not o.k.}$$

$$t = \sqrt{12} \rightarrow t^2 = 12 \rightarrow x^4 = 12 \rightarrow x = \pm \sqrt[4]{12}$$

$$f(\sqrt[4]{12}) = 4 \cdot \sqrt[4]{12} + 2\sqrt{4-(\sqrt[4]{12})^2} = 8.81 \rightarrow (\sqrt[4]{12}, 8.81)$$

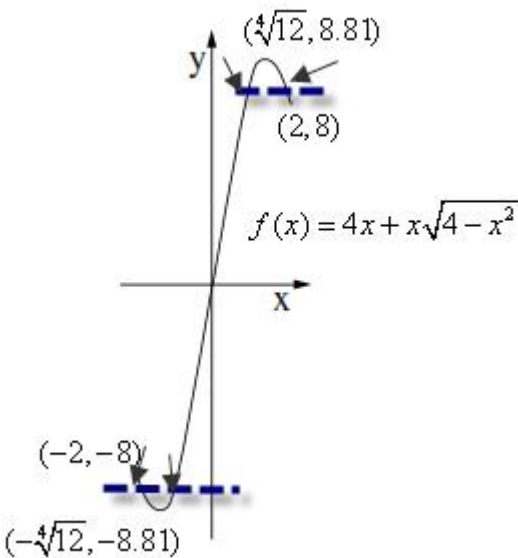
$$f(-\sqrt[4]{12}) = 4 \cdot (-\sqrt[4]{12}) + 2\sqrt{4-(-\sqrt[4]{12})^2} = -8.81 \rightarrow (-\sqrt[4]{12}, -8.81)$$

$$(-\sqrt[4]{12}, -8.81),$$

$$(\sqrt[4]{12}, 8.81)$$

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, $k > 0$, .

$$8 \leq k < 8.81$$

$$.8 \leq k < 8.81 :$$