

$$\cdot 20 \quad a_1, a_2, a_3, a_4$$

$$20 = \frac{4 \cdot (2a_1 + 3d)}{2}$$

$$\boxed{2a_1 + 3d = 10}$$

$$\cdot d > 0 \quad ,$$

$$a_1, a_2, a_4$$

$$(a_2)^2 = a_1 \cdot a_4$$

$$(a_1 + d)^2 = a_1 \cdot (a_1 + 3d)$$

$$\cdot a_1^2 + 2a_1d + d^2 = a_1^2 + 3a_1d$$

$$d^2 = a_1d \quad /: d > 0$$

$$\boxed{a_1 = d}$$

:

$$2d + 3d = 10$$

$$5d = 10 \quad /: 5$$

$$\boxed{d = 2}$$

.2

, :

$$\cdot (b_n \quad)$$

$$\cdot 0 < q < 1 \quad ,$$

$$\frac{a_2}{a_3 - a_1}$$

$$\cdot b_1 = \frac{4}{6-2} = 1$$

$$\cdot a_1 = 2, a_2 = 4, a_3 = 6 \quad ,$$

.2

$$2 = \frac{1}{1-q}$$

$$1-q = \frac{1}{2}$$

$$\boxed{q = 0.5}$$

6

$$S_6^b = \frac{1 \cdot (0.5^6 - 1)}{0.5 - 1} = 1 \frac{31}{32}$$

$$\cdot 1 \frac{31}{32} \quad :$$

ABCD

SABCD

SO

SO = x

x

ΔCDB

OF = 0.5x

OF

SF

∠SFO

ΔSKO

$$\cos \angle SKO = \frac{KO}{SK}$$

$$\cos 68^\circ = \frac{KO}{16} \quad / \cdot 16$$

$$16 \cos 68^\circ = KO$$

63.43°

SF

:

SCD

SF

ΔSOF

$$(SF)^2 = (SO)^2 + (OF)^2$$

$$(SF)^2 = x^2 + (0.5x)^2$$

$$\boxed{SF = 0.5x\sqrt{5}}$$

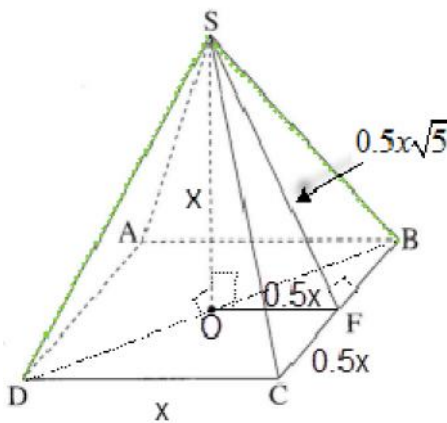
ΔSCF

$$\tan \angle CSF = \frac{CF}{SF} = \frac{0.5x}{0.5x\sqrt{5}}$$

$$\angle CSF = 24.09^\circ$$

$$\angle CSB = 2 \cdot 24.09^\circ = 48.19^\circ$$

$$\angle CSB = 48.19^\circ :$$



1125

$$1125 = \frac{x^2 \cdot x}{3} \rightarrow \boxed{x = 15cm}$$

(

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ΔSDB

SO = 15

(ΔCDB

) 15√2

$$S_{\Delta SDB} = \frac{15\sqrt{2} \cdot 15}{2} = 159.1$$

"

159.1

ΔSDB

:

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

(1)

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

$$f'(x) = \cos x - \sin(2x)$$

$$f'(x) = \cos x - 2 \sin x \cos x$$

$$0 = \cos x(1 - 2 \sin x)$$

$$\cos x = 0 \quad \sin x = 0.5 = \sin \frac{\pi}{6}$$

$$x = \frac{\pi}{2} + 2\pi k \quad x = \frac{5\pi}{6} + 2\pi k \quad x = \frac{3\pi}{2} + 2\pi k$$

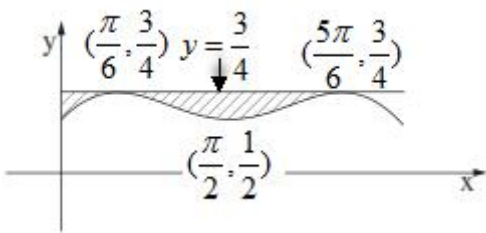
$$x = \frac{\pi}{2} \rightarrow \left(\frac{\pi}{2}, \frac{1}{2}\right) \quad x = \frac{5\pi}{6} \rightarrow \left(\frac{5\pi}{6}, \frac{3}{4}\right) \quad x = \frac{3\pi}{2} \rightarrow \left(\frac{3\pi}{2}, \frac{3}{4}\right)$$

$$y = \frac{3}{4}$$

$$\left(\frac{\pi}{2}, \frac{1}{2}\right) \quad \left(\frac{5\pi}{6}, \frac{3}{4}\right) \quad \left(\frac{3\pi}{2}, \frac{3}{4}\right)$$

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

$$y = \frac{3}{4}$$



$$S = \int_0^{\frac{5\pi}{6}} \left(\frac{3}{4} - (\sin x + \frac{1}{2} \cos 2x)\right) dx = \int_0^{\frac{5\pi}{6}} \left(\frac{3}{4} - \sin x - \frac{1}{2} \cos 2x\right) dx$$

$$S = \left[\frac{3}{4}x + \cos x - \frac{1}{4} \sin 2x\right]_0^{\frac{5\pi}{6}} = \left[\frac{3}{4}x + \cos x - \frac{1}{4} \sin 2x\right]_0^{\frac{5\pi}{6}}$$

$$x = \frac{5\pi}{6} : 1.314$$

$$x = 0 : 1$$

$$S = (1.314) - (1) = 0.314$$

" 0.314 :

$$f(x) = \frac{3}{4}$$

$$g(x) = f(x) - \frac{3}{4}$$

$$\frac{3}{4} - \frac{3}{4} = 0 \quad \left(\frac{\pi}{2}, \frac{1}{2}\right)$$

y - ,

, y = 0 , x -

. y = 0 :

"

$$a < 2 \quad f(x) = \frac{x^2 + 2x + a}{e^x}$$

$$a \quad x -$$

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

$$0 = e^x(2x+2 - x^2 - 2x - a) / : e^x > 0$$

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

$$x^2 = 2 - a$$

$$x = \pm\sqrt{2-a} \quad / a < 2 \rightarrow o.k.$$

.2

$$\sqrt{2-a} - (-\sqrt{2-a}) = 2$$

$$2\sqrt{2-a} = 2$$

$$\sqrt{2-a} = 1 \quad ()^2$$

$$2-a = 1$$

$$\boxed{a=1} \quad \text{test: } \sqrt{2-1} = 1 \rightarrow 1=1 \rightarrow o.k.$$

. a = 1 :

$$f(x) = \frac{x^2 + 2x + 1}{e^x} \quad ; \quad a = 1 \quad (1)$$

:

$$y = 0, \quad f(10) = 5.5 \cdot 10^{-3} \rightarrow +0, \quad f(-10) = 1784143 \rightarrow +\infty$$

$$f(x) = \frac{x^2 + 2x + 1}{e^x}$$

$$f(0) = \frac{0^2 + 2 \cdot 0 + 1}{e^0} = 1 \rightarrow (0,1) : y$$

$$0 = x^2 + 2x + 1 = (x+1)^2 \rightarrow (-1,0) : x$$

. (-1,0) , (0,1) :

(2)

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

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

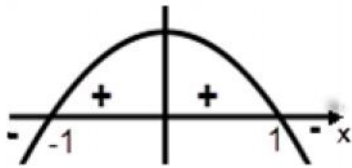
$$\boxed{f'(x) = \frac{-x^2+1}{e^x}}$$

$$0 = -x^2 + 1$$

$$x^2 = 1$$

$$x = 1 \rightarrow f(1) = \frac{1^2 + 2 \cdot 1 + 1}{e^1} = \frac{4}{e} \rightarrow \boxed{\left(1, \frac{4}{e}\right)}$$

$$x = -1 \rightarrow f(-1) = \frac{(-1)^2 + 2 \cdot (-1) + 1}{e^{-1}} = 0 \rightarrow \boxed{(-1, 0)}$$



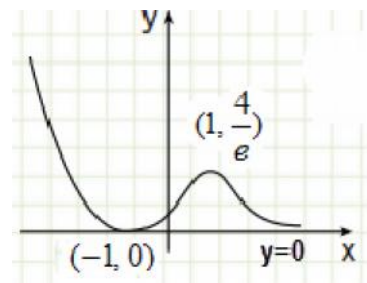
," ")
() x = -1

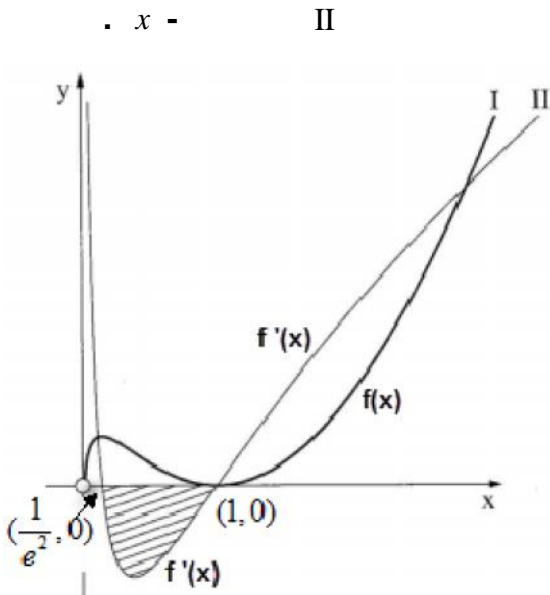
.() x = 1

. (-1, 0) , (1, $\frac{4}{e}$) :

. f(x)

(3)





$f(x)$ I , II
 $f'(x)$ I , II
 $f'(x) - II$, $f(x) - I$:
 $f(x) = 2x(\ln x)^2$
 $x > 0$ $\ln x$
 $x > 0$:

$f'(x)$

$$f'(x) = 2(\ln x)^2 + 2x \cdot 2(\ln x) \cdot \frac{1}{x}$$

$$f'(x) = 2\ln x (\ln x + 2)$$

$$\ln x = 0 \rightarrow x = 1 \rightarrow (1, 0)$$

$$\ln x = -2 \rightarrow x = e^{-2} = \frac{1}{e^2} \rightarrow \left(\frac{1}{e^2}, 0\right)$$

$\left(\frac{1}{e^2}, 0\right)$, $(1, 0)$:

$f'(x) > 0$, $f(x)$

$$0 < x < \frac{1}{e^2} \quad x > 1 :$$

$f'(x)$ x

$$S = \int_{\frac{1}{e^2}}^1 (0 - f'(x)) dx$$

$$S = -f(x) \Big|_{\frac{1}{e^2}}^1$$

$$S = -f(1) - (-f(\frac{1}{e^2})) = -0 + \frac{2}{e^2} \cdot 4$$

$$S = \frac{8}{e^2} \approx 1.083$$

" $\frac{8}{e^2} \approx 1.083$:

"