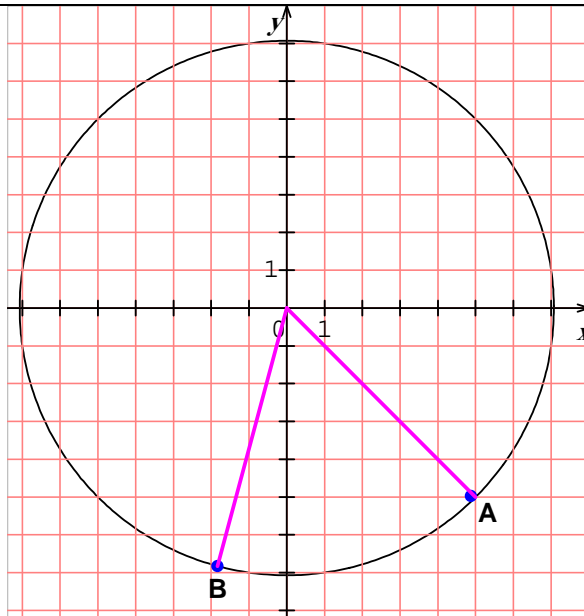


-
: 3 :

	مجزأة		
04	0.25	$z_B = 5\sqrt{2}e^{-\frac{7\pi}{12}i} \quad z_A = 5 - 5i$	(1)
	0.5	$z_A = 5\sqrt{2}e^{-\frac{\pi}{4}i}$	(2)
	0.5	$z' = e^{-i\frac{\pi}{3}} z$	(3)
	0.5	$-\frac{\pi}{3} \quad O \quad : T$	(4)
	0.5	$e^{-i\frac{\pi}{3}} z_A = z_B = e^{-i\frac{\pi}{3}} \times 5\sqrt{2}e^{-\frac{\pi}{4}i} = 5\sqrt{2}e^{-\frac{7\pi}{12}i} = z_B$	(5)
	0.25	$T(A) = B$	(6)
	0.5	$e^{-i\frac{\pi}{3}} = \frac{1}{2} - \frac{\sqrt{3}}{2}i$	(7)
	0.5	$z_B = \left(\frac{1}{2} - \frac{\sqrt{3}}{2}i\right)(5 - 5i) = \left(\frac{5 - 5\sqrt{3}}{2}\right) - \left(\frac{5 + 5\sqrt{3}}{2}\right)i$	(8)
	0.5	$\sin\left(-\frac{7\pi}{12}\right) \quad \cos\left(-\frac{7\pi}{12}\right) :$	(9)
	0.5	$\cos\left(-\frac{7\pi}{12}\right) = \frac{5 - 5\sqrt{3}}{2 \times 5\sqrt{2}} = \frac{\sqrt{2} - \sqrt{6}}{4}$	(10)
	0.5	$\sin\left(-\frac{7\pi}{12}\right) = \frac{-5 - 5\sqrt{3}}{2 \times 5\sqrt{2}} = -\left(\frac{\sqrt{2} + \sqrt{6}}{4}\right)$	(11)



04

0.5
0.5

$$C_6^2 = 15 :$$

$$\cdot X(\Omega) = \{0; 1; 2\} : X \quad (1)$$

$$\cdot X \quad ($$

x_i	0	1	2
$P(X = x_i)$	$\frac{4}{15}$	$\frac{8}{15}$	$\frac{3}{15}$

01.5

$$\cdot E(X) = \frac{0+8+6}{15} = \frac{14}{15} \approx 0,93 \quad ($$

0.5

$$B \quad A \quad (2)$$

01

$$P_B(A) = \frac{P(A \cap B)}{P(B)} = \frac{\frac{3}{15}}{\frac{9}{15}} = \frac{3}{9} = \frac{1}{3}$$

05

01.5

$$x^2 + y^2 + z^2 - 2x + 4y - 6z - 11 = 0 \quad (1)$$

$$(x-1)^2 + (y+2)^2 + (z-3)^2 = 25$$

$$\cdot r = 5$$

$$\omega(1; -2; 3) \quad (S) :$$

01

$$(P) \quad d(\omega; (P)) = \frac{|4-6-23|}{\sqrt{16+9}} = 5 = r \quad (2)$$

01

$$(P) \quad \omega \quad (\Delta) \quad (3)$$

07

01.5

(Δ)

$$\begin{cases} x = 1 + 4t \\ y = -2 + 3t \\ z = 3 \end{cases} ; t \in \mathbb{R} :$$

(P)

A

(4)

$$\begin{cases} x = 1 + 4t \dots (1) \\ y = -2 + 3t \dots (2) \\ z = 3 \dots (3) \\ 4x + 3y - 23 = 0 \dots (4) \end{cases} \quad (P)$$

. A(5;1;3) t = 1 (4) (3) (2) (1)

. f(x) = $\frac{e^x}{e^x - 1}$: □ * f

: f (1)

02

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

0.5

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

:

01

x	-∞		0		+∞
f'(x)	-				-
f(x)	+∞	↘		↘	-∞

01

: ln 2 (C_f) (T) (2)

y = -2x + 2ln 2 + 2

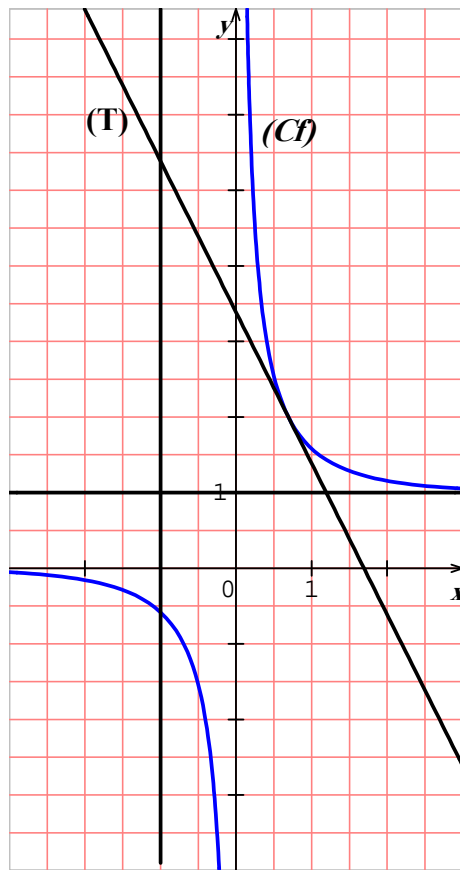
:(C_f) ω(0; $\frac{1}{2}$) (3)

01

f(-x) + f(x) = 1

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

01.5



$\cdot(C_f)$ (4)