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:
3 :

	مجزأة												
04		$n \qquad u_1 = 1$ $v_n = u_n + 3 \quad u_{n+1} = 2u_n + 3$ $(v_n) \quad v_{n+1} = u_{n+1} + 3 = 2u_n + 6 = 2v_n \quad (1)$ $. v_1 = 4 \qquad q = 2$ $. v_n = 4 \times 2^{n-1} = 2^{n+1} : n \quad v_n$ $u_n = v_n - 3 = 2^{n+1} - 3 : n \quad u_n$ $. S_n = u_1 + u_2 + \dots + u_n = (v_1 + v_2 + \dots + v_n) - 3n \quad (2)$ $= 4(2^n - 1) - 3n$ $. n = 3 \quad 4(2^3 - 1) - 3n = 28 - 3n \quad S_n = 28 - 3n$											
04	0.5	$C_{12}^2 = 66 : \quad (1)$ $. P(A) = \frac{C_3^2 + C_4^2 + C_5^2}{C_{12}^2} = \frac{3 + 6 + 10}{66} = \frac{19}{66} \quad ($											
	0.5	$P(B) = 1 - \frac{C_7^2}{C_{12}^2} = \frac{21}{66} = \frac{7}{22}$											
	0.5	$P(A \cap B) = \frac{C_5^2}{C_{12}^2} = \frac{10}{66} = \frac{5}{33}$											
	0.5	$. B \ A \quad P(A \cap B) \neq P(A) \times P(B) \quad ($											
	0.25	$X(\Omega) = \{2; 3; 4; 4; 5\} : \quad X \quad (2$											
	0.25	$. X$											
	0.1	<table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">x_i</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">3</td> <td style="padding: 5px;">4</td> <td style="padding: 5px;">5</td> </tr> <tr> <td style="padding: 5px;">$P(X = x_i)$</td> <td style="padding: 5px;">$\frac{10}{66}$</td> <td style="padding: 5px;">$\frac{30}{66}$</td> <td style="padding: 5px;">$\frac{20}{66}$</td> <td style="padding: 5px;">$\frac{6}{66}$</td> </tr> </table>	x_i	2	3	4	5	$P(X = x_i)$	$\frac{10}{66}$	$\frac{30}{66}$	$\frac{20}{66}$	$\frac{6}{66}$	
x_i	2	3	4	5									
$P(X = x_i)$	$\frac{10}{66}$	$\frac{30}{66}$	$\frac{20}{66}$	$\frac{6}{66}$									
	0.5	$. E(X) = \frac{20 + 90 + 80 + 30}{66} = \frac{220}{66} \approx 3,33 \quad ($											

05

0.5

$$z_B = 5\sqrt{2}e^{-\frac{7\pi}{12}i} \quad z_A = 5 - 5i \quad (1)$$

0.5

: A (

0.75

$$z_A = 5\sqrt{2}e^{-\frac{\pi}{4}i} : z_A ($$

$$M'(z') \quad M(z) \quad T \quad (2)$$

0.75

$$z' = e^{-i\frac{\pi}{3}} z :$$

$$-\frac{\pi}{3} \quad O \quad : T \quad ($$

0.5

$$e^{-i\frac{\pi}{3}} z_A = z_B = e^{-i\frac{\pi}{3}} \times 5\sqrt{2}e^{-\frac{\pi}{4}i} = 5\sqrt{2}e^{-\frac{7\pi}{12}i} = z_B ($$

0.5

$$. T(A) = B$$

: B (

0.5

$$e^{-i\frac{\pi}{3}} = \frac{1}{2} - \frac{\sqrt{3}}{2}i : e^{-i\frac{\pi}{3}} \quad (3)$$

0.5

: z_B (

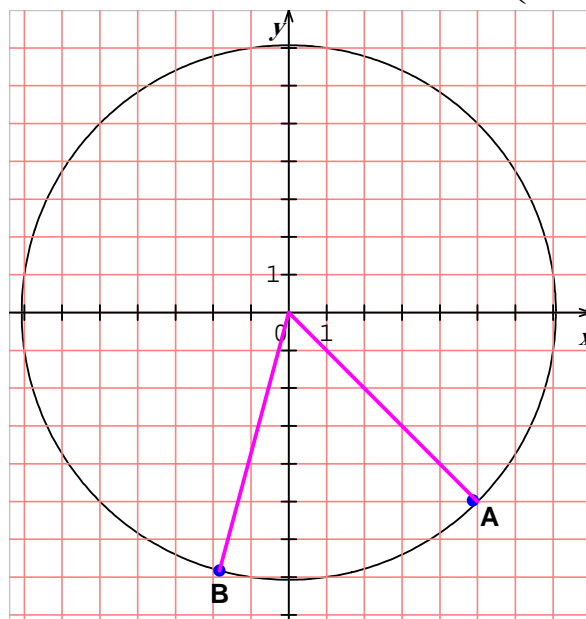
$$z_B = \left(\frac{1}{2} - \frac{\sqrt{3}}{2}i\right)(5 - 5i) = \left(\frac{5 - 5\sqrt{3}}{2}\right) - \left(\frac{5 + 5\sqrt{3}}{2}\right)i$$

0.5

$$: \sin\left(-\frac{7\pi}{12}\right) \quad \cos\left(-\frac{7\pi}{12}\right) : ($$

$$\cdot \cos\left(-\frac{7\pi}{12}\right) = \frac{5 - 5\sqrt{3}}{2 \times 5\sqrt{2}} = \frac{\sqrt{2} - \sqrt{6}}{4}$$

$$\sin\left(-\frac{7\pi}{12}\right) = \frac{-5 - 5\sqrt{3}}{2 \times 5\sqrt{2}} = -\left(\frac{\sqrt{2} + \sqrt{6}}{4}\right)$$



07

0.5

: $]-\infty; -2[\cup]0; +\infty[$ f

$$f(x) = x - 3 + \ln\left(\frac{x}{x+2}\right)$$

0.5

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

0.5

$$\lim_{x \rightarrow 0^+} f(x) = -\infty \quad \lim_{x \rightarrow -2^-} f(x) = +\infty$$

0.75

$$\lim_{|x| \rightarrow +\infty} [f(x) - (x-3)] = \lim_{|x| \rightarrow +\infty} \ln\left(\frac{x}{x+2}\right) = 0$$

$$x = -2$$

$$y = x - 3 \quad (\Delta) \quad x = 0$$

0.75

: (Δ) (C_f) (2)

$$f(x) - (x-3) = \ln\left(\frac{x}{x+2}\right)$$

x	$-\infty$	-2	0	$+\infty$
$\ln\left(\frac{x}{x+2}\right)$	+			-
	(Δ)	(C_f)		(Δ) (C_f)

0.5

: f (3)

$$f'(x) = \frac{x^2 + 2x + 2}{x(x+2)} > 0$$

0.5

: $f'(x)$

0.5

:

x	$-\infty$	-2	0	$+\infty$
$f'(x)$	+			+
$f(x)$	$-\infty$ ↗	$+\infty$		$-\infty$ ↗ $+\infty$

: $[3; 3,5]$ f (4)

0.75

$$f(3,5) = 0,05 > 0 \quad f(3) = -0,51 < 0$$

$$]3; 3,5[\quad \alpha \quad f(x) = 0$$

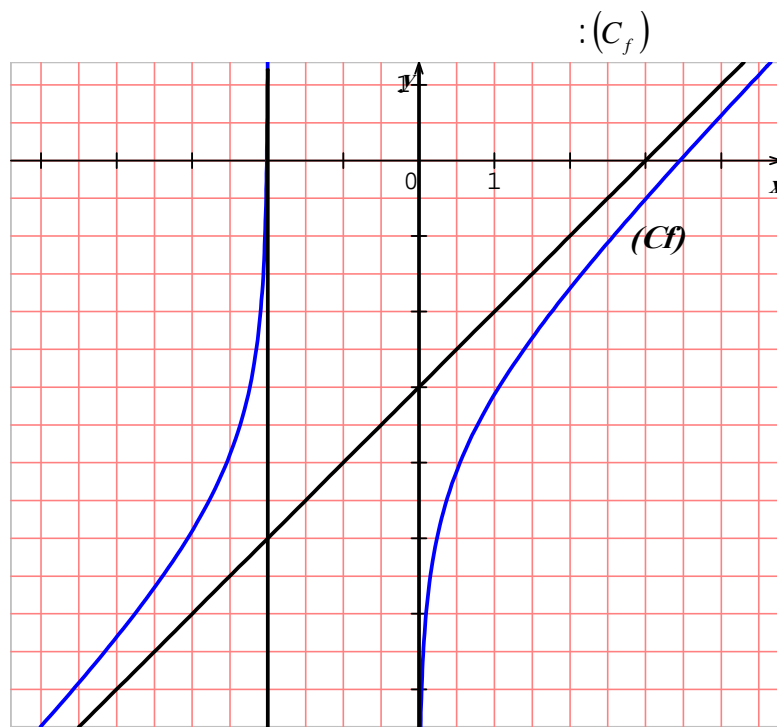
: (C_f) $\omega(-1; -4)$ (5)

$$f(-x-2) + f(x) = -8$$

0.75

$$f(-x-2) + f(x) = -x - 5 + \ln\left(\frac{-x-2}{-x}\right) + x - 3 + \ln\left(\frac{x}{x+2}\right) = -8$$

01



(6)