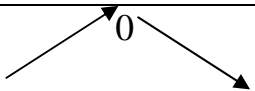
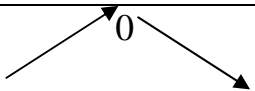
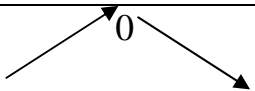


2011 -	
:	3 :

	مجزأة														
04	0.5	$f(x) = \ln(x+1) :]-1; +\infty[\quad f \quad (1)$													
	01	$f(x) = \frac{1}{x+1} > 0$ $u_{n+1} = \ln(1+u_n) \quad u_0 = e \quad (2)$													
	0.5	$u_n > 0 : n$ $u_0 = e \quad u_0 > 0 \quad n = 0$ $u_{n+1} > 0 \quad u_n > 0$													
	0.5	$u_{n+1} > 0 \quad \ln(u_n + 1) > 0 \quad u_n + 1 > 1 \quad u_n > 0$ $u_n > 0 : n \in \mathbb{N}$													
	0.5	$g(x) = \ln(x+1) - x :]-1; +\infty[\quad g \quad (3)$													
		: g													
	0.5	$g'(x) = -\frac{x}{x+1}$ $g'(x)$													
	0.5	: g													
		<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">x</td> <td style="padding: 5px;">-1</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">+∞</td> </tr> <tr> <td style="padding: 5px;">g'(x)</td> <td style="padding: 5px;">+</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">-</td> </tr> <tr> <td style="padding: 5px;">g(x)</td> <td colspan="3" style="text-align: center; padding: 5px;">  </td> </tr> </table>	x	-1	0	+∞	g'(x)	+	0	-	g(x)				
x	-1	0	+∞												
g'(x)	+	0	-												
g(x)															
	0.5	: g(x)													
	0.5	$g(x) \leq 0 : x \in]-1; +\infty[$: (u_n) $u_{n+1} - u_n = \ln(1+u_n) - u_n = g(u_n) \leq 0$: (u_n)													

05	01.5	$p(z) = z^3 - 12z^2 + 48z - 128$	
		$p(z) = (z - 8)(z^2 - 4z + 16)$ (1)	
	01.5	$p(z) = 0$ (
		$z_3 = 8 \quad z_2 = 2 + 2\sqrt{3}i \quad z_1 = 2 - 2\sqrt{3}i$	
		: C B A: (2)	
		$z_3 = 8 \quad z_2 = 2 + 2\sqrt{3}i \quad z_1 = 2 - 2\sqrt{3}i$	
	01	: $\frac{z_1 - z_3}{z_2 - z_3}$ (
		$\frac{z_1 - z_3}{z_2 - z_3} = e^{\frac{\pi}{3}i}$	
	01	$(z_1 - z_3) = e^{\frac{\pi}{3}i} (z_2 - z_3) \quad \frac{z_1 - z_3}{z_2 - z_3} = e^{\frac{\pi}{3}i}$ (
		$\frac{\pi}{3}$ C B A	
04	01	C B A (1)	
	01	$\vec{n}(2; 2; -1) \quad \vec{ED}(-2; -2; -1)$ (2)	
	01	$\vec{AB} \cdot \vec{CD} = 0$ (3)	
	01	$\vec{AI} // \vec{AB}$ (4)	
07	0.5	$f(x) = x + 1 + \ln(x + 1) - \ln(x + 2)$	
		$\lim_{x \rightarrow -1} f(x) = -\infty$ (1)	
	0.5	$\lim_{x \rightarrow +\infty} \ln\left(\frac{x+1}{x+2}\right) = \lim_{t \rightarrow 1} \ln t = 0$ (2)	
	0.5	$\lim_{x \rightarrow +\infty} f(x) = \lim_{x \rightarrow +\infty} \left(x + 1 + \ln\left(\frac{x+1}{x+2}\right)\right) = +\infty$	
		$\lim_{x \rightarrow +\infty} (f(x) - (x + 1)) = \lim_{x \rightarrow +\infty} \ln\left(\frac{x+1}{x+2}\right) = 0$ (3)	
	0.5	$+\infty$ (C _f) (Δ): y = x + 1	
		(Δ) (C _f)	
0.5	(Δ) (C _f) $f(x) - (x + 1) = \ln\left(\frac{x+1}{x+2}\right) < 0$		

0.5

: f

(4)

0.5

$$f'(x) = 1 + \frac{1}{x+1} - \frac{1}{x+2} = \frac{x^2 + 3x + 3}{x^2 + 3x + 2}$$

0.5

:

x	-1	$+\infty$
$f'(x)$	+	
$f(x)$	$-\infty \rightarrow +\infty$	

0.5

$$: x = 0$$

(T)

(5)

$$(T): y = \frac{3}{2}x + 1 - \ln 2$$

0.5

:

α

(C_f)

(6)

$$) . -\frac{1}{2} < \alpha < 0$$

02

. (Δ) (T)

(C_f)

(7)

