

2025

30 03:

:

:

(04) :

U_1

4

6

1

1

3

U_2

U_1

1.

3

U_2

U_1

2.

X

X

(04) :

(v_n) (u_n)

n

$u_0 = 3$: $\mathbb{N}$

$$v_n = \frac{u_n + 3}{u_n - 2} \quad u_{n+1} = \frac{5u_n - 4}{1 + u_n}$$

$u_n > 2$ n

1.

(u_n)

$\frac{5}{3}$

v_n n

(v_n)

$\lim_{n \rightarrow +\infty} u_n$

n

u_n

$$S_n = \frac{1}{u_0 - 2} + \frac{1}{u_1 - 2} + \dots + \frac{1}{u_n - 2} :$$

(04) :

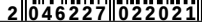
$$(z + 3 + 2i)(z^2 - z + 5) = 0 : z$$

$\mathbb{C}$

(I)

$(O; \vec{u}, \vec{v})$

(II)



$$z_D = -1 \quad z_C = -3 + 2i \quad z_B = \overline{z_A} \quad z_A = 1 - 2i$$

$$D \quad C \quad B \quad A$$

$$\cdot |z_C - z_D| \quad |z_B - z_D| \quad |z_A - z_D| \quad \cdot \mathbf{.1}$$

C B A $\bullet$

$$\frac{z_A - z_B}{z_C - z_B} \quad \mathbf{.2}$$

$$\{(A; 1), (B; -1), (C; 1)\} \quad G \quad z_G \quad \mathbf{- .3}$$

■ *ABCG* ■

(08) :

$$g(x) = \frac{\ln x}{x} + e :]0; +\infty[\quad g \text{ est } \mathbf{1}$$

■ *g* —

$$]0; +\infty[\quad g(x) \quad g\left(\frac{1}{e}\right)$$

$$f(x) = \frac{1}{2}(\ln x)^2 + ex - e :]0; +\infty[\quad f'.$$

$$\mathbf{z}(O; \vec{i}, \vec{j}) \quad (C_f)$$

$$]0; +\infty[\quad f \quad f'(x) = g(x) :]0; +\infty[\quad x$$

$$-\infty < x < +\infty, \quad 0 \leq f \leq 1.$$

$$\mathbf{.1} \qquad (C_f) \qquad (T) \qquad \mathbf{.3}$$

$$\cdot(T) \quad (C_f) \quad \cdot 4$$

$$\cdot(C_f) \quad (T) \quad \cdot 5$$

$$b \leq a \quad h(x) = x [(\ln x)^2 + a \ln x + b] : \quad]0; +\infty[\quad h \geq 0$$

$$x \mapsto (\ln x)^2 \qquad h \qquad b \qquad a \qquad -$$

$$x = \frac{1}{e} \quad (C_f) \quad A \quad cm^2 \quad \cdot$$

$$y = ex - e \quad x = 1$$

$$k(x) = e^{2x+1} + 2x^2 - e : \quad \mathbb{R} \quad k \quad \mathbf{.7}$$

$$k(x) = f(e^{2x}) : \mathbb{R} \rightarrow \mathbb{R}.$$

$$k$$

(05) :

1 1 1 0 : 2 0 2 2

.1

" : A

" : B

" : C

" : D

$$P(B \cap D) = \frac{17}{84} : .2$$

X .3

X

.E(X)

.4

n

n

(04) :

$$u_{n+1} = \frac{4u_n}{1 + u_n} : n$$

$$u_0 = 1 (u_n)$$

$$0 < u_n < 3 : n$$

$$u_2 \quad u_1 - .1$$

$$v_n = \frac{u_n - 3}{u_n} : n (v_n) .2$$

$$\frac{1}{4}$$

$$(v_n)$$

$$(u_n)$$

$$n$$

$$u_n \quad v_n$$

$$S_n = w_0 + w_1 + w_2 + \dots + w_n$$

$$w_n = \frac{3}{u_n} : n$$

$$(w_n) .3$$

$$w_n = 1 - v_n : n$$

$$S_n = n + 1 + \frac{8}{3} \left(1 - \left(\frac{1}{4} \right)^{n+1} \right) : n$$

$$\lim_{n \rightarrow +\infty} \frac{S_n}{n} :$$

(04) :

$$\begin{cases} \alpha + \beta = -1 \\ 2\bar{\alpha} + \beta = 6i \end{cases} : \beta \quad \alpha \quad .1$$

$$B \quad A \quad I \quad (O; \vec{u}, \vec{v}) \quad .2$$

$$.z_B = -2 + 2i \quad z_A = 1 - 2i \quad z_I = 1$$

$$.B \quad A \quad I \quad -$$

$$.[AB] \quad (C) \quad w \quad z_w \quad -$$

$$.(C) \quad D \quad z_D \quad z_D = \frac{3+9i}{4+2i} \quad D \quad .3$$

$$z_E = e^{i\frac{\pi}{4}} z_I + (1 - e^{i\frac{\pi}{4}}) .z_w \quad z_E \quad (C) \quad E \quad .4$$

$$. \quad z_E + \frac{1}{2} \quad -$$

$$z_E = \frac{3\sqrt{2}-2}{4} + \frac{3\sqrt{2}}{4}i \quad -$$

(07) :

$$(\Delta) \quad x \mapsto e^{-2x} \quad (\gamma) \quad .1$$

$$.(\Delta) \quad (\gamma) \quad \alpha \quad y = 4x + 2$$

$$g(x) = e^{-2x} - 4x - 2 : \quad \mathbb{R} \quad g$$

$$\mathbb{R} \quad (\Delta) \quad (\gamma) \quad -$$

$$.g(x) \quad x$$

$$-0,16 < \alpha < -0,15 : \quad -$$

$$.f(x) = x + 3 - 2xe^{2x} : \quad \mathbb{R} \quad f \quad .2$$

$$(O; \vec{i}, \vec{j}) \quad (C_f)$$

$$.+ \infty \quad - \infty \quad f \quad -$$

$$.f \quad f'(x) = e^{2x} g(x) \quad x \quad -$$

$$.(D) \quad (C_f) \quad (D) \quad (C_f) \quad .3$$

$$.f(\alpha) = \frac{2\alpha^2 + 6\alpha + 3}{2\alpha + 1} : \quad .4$$

$$.(f(\alpha) = 3,07 \quad) (C_f) \quad (D) \quad .5$$

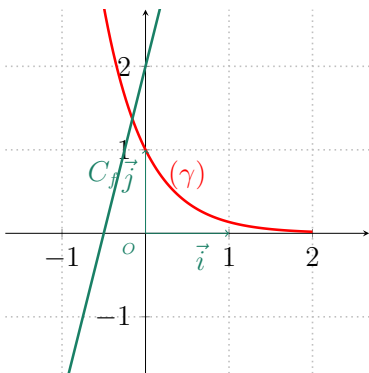
$$(D) \quad (C_f) \quad - \quad .6$$

$$. \quad f(x) = x + m \quad m \quad -$$

$$\int_0^x 2te^{2t} dt \quad x \quad .7$$

$$(C_f) \quad A(\lambda) \quad \lambda \quad 0 \quad \lambda \quad -$$

$$. \lim_{\lambda \rightarrow -\infty} A(\lambda) \quad y = x + 3 \quad x = \lambda \quad x = 0$$



.2cm