

A CSOPORT:

$$1 a) \quad \underline{u} \times \underline{v} = \begin{vmatrix} \underline{i} & \underline{j} & \underline{k} \\ u_1 & u_2 & u_3 \\ v_1 & v_2 & v_3 \end{vmatrix} = (u_2 \cdot v_3 - u_3 \cdot v_2) \cdot \underline{i} +$$

$$+ (u_3 \cdot v_1 - u_1 \cdot v_3) \cdot \underline{j} + (u_1 \cdot v_2 - u_2 \cdot v_1) \cdot \underline{k}, \text{ TENÁT}$$

$$\underline{u} \times \underline{v} = (x, y, z), \text{ ANOL} \quad \begin{aligned} x &= u_2 \cdot v_3 - u_3 \cdot v_2 \\ y &= u_3 \cdot v_1 - u_1 \cdot v_3 \\ z &= u_1 \cdot v_2 - u_2 \cdot v_1 \end{aligned}$$

GEOM. JELENTÉS: $|\underline{u} \times \underline{v}| = |\underline{u}| \cdot |\underline{v}| \cdot \sin(\varphi)$,

ANOL φ AZ \underline{u} ÉS \underline{v} VEKTOROK SZÖGÉ

$\underline{u} \times \underline{v}$ MERŐLEGES \underline{u} -RA ÉS \underline{v} -RE

JOBBKÉZ-SZABÁLY:



b) VEGYES SZORZAT: $\underline{u} \cdot (\underline{v} \times \underline{w}) = (\underline{u}, \underline{v}, \underline{w})$

SKALÁRIS

VEKTORIA'LIS

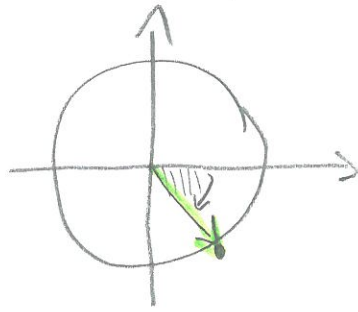
$|(\underline{u}, \underline{v}, \underline{w})| =$ HÁROM VEKTOR ÁLTAL KIFEJEZETT

TETT PARALLELEPIPEDON TÉRFOGATA

1. OLDAL

$$\textcircled{2} \text{ a) } z = 2 - 2i \quad |z| = \sqrt{2^2 + (-2)^2} = \sqrt{8} = 2\sqrt{2}$$

$$\frac{z}{|z|} = \frac{1}{\sqrt{2}} - \frac{1}{\sqrt{2}} \cdot i = \cos\left(-\frac{\pi}{4}\right) + i \cdot \sin\left(-\frac{\pi}{4}\right)$$



ТЕНАЇТ

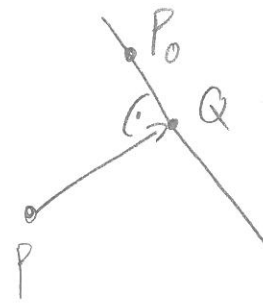
$$z = \sqrt{8} \cdot \left(\cos\left(-\frac{\pi}{4}\right) + i \cdot \sin\left(-\frac{\pi}{4}\right) \right)$$

$$\text{b) } z^9 = \sqrt{8}^9 \cdot \left(\cos\left(-9 \cdot \frac{\pi}{4}\right) + i \cdot \sin\left(-9 \cdot \frac{\pi}{4}\right) \right) =$$
$$= 2^{27/2} \cdot \left(\cos\left(-\frac{\pi}{4}\right) + i \cdot \sin\left(-\frac{\pi}{4}\right) \right) =$$

$$\text{c) } = 2^{13} \cdot \sqrt{2} \cdot \left(\frac{1}{\sqrt{2}} - \frac{1}{\sqrt{2}} \cdot i \right) =$$
$$= 2^{13} - 2^{13} \cdot i = 8192 - 8192 \cdot i$$

$$\textcircled{3} \quad P_t = (t, 1+t, 2-t)$$

$$P = (1, -1, 0)$$



EGYENES IRÁNYVEKTORA:

$$\underline{v} = (1, 1, -1) \quad \text{KELL OLYAN } t, \text{ AMIRE}$$

$$\boxed{\overrightarrow{PP_t} \perp \underline{v}}, \text{ AZAZ } (t-1, 1+t-(-1), 2-t-0) \perp \underline{v},$$

$$\text{AZAZ } (t-1) \cdot 1 + (2+t) \cdot 1 + (2-t) \cdot (-1) = 0$$

$$\text{AZAZ } t-1+2+t+t-2=0$$

$$3t-1=0 \Rightarrow \boxed{t=1/3}, \text{ TENÁT}$$

$$Q = P_t = P_{1/3} = (1/3, 4/3, 5/3)$$

$$d = |\overrightarrow{PQ}| = \sqrt{(1/3-1)^2 + (4/3+1)^2 + (5/3-0)^2} =$$

$$= \sqrt{\frac{4}{9} + \frac{49}{9} + \frac{25}{9}} = \frac{\sqrt{78}}{3}$$

3.0L D A C

$$(4) \quad \lim_{n \rightarrow \infty} a_n = \lim_{n \rightarrow \infty} \frac{2+3n}{12n-8} = \frac{3}{12} = \frac{1}{4} = A$$

$$|a_n - A| = \left| \frac{2+3n}{12n-8} - \frac{1}{4} \right| = \left| \frac{2+3n}{12n-8} - \frac{3n-2}{12n-8} \right| =$$

$$= \left| \frac{4}{12n-8} \right| \leq \frac{1}{600}$$

↑
KELL

$$\boxed{\frac{4}{12n-8} \leq \frac{1}{600}} \Leftrightarrow \boxed{2400 \leq 12n-8} \Leftrightarrow$$

$$\Leftrightarrow \boxed{200 \leq n - \frac{8}{12}} \Leftrightarrow \boxed{200 + \frac{8}{12} \leq n}$$

TENÁT N A LEGKISEBB EGÉSZ
SZÁM, AMI NAGYOBB VAGY EGYENLŐ
 $(200 + \frac{8}{12})$ -NÉL: $\boxed{N = 201}$