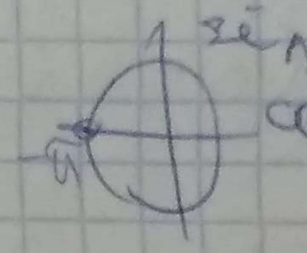
Дополнительный тест, 18:00 - 19:30 (2 часа) 19.01

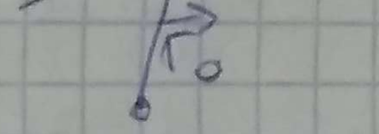
(10) $z = 4 - 5i = \sqrt{41}\left(\frac{4}{\sqrt{41}} - \frac{5}{\sqrt{41}}i\right)$



$\sin\varphi = -\frac{5}{\sqrt{41}}$

$6{,}403124237 \quad \varphi = \arcsin\left(-\frac{5}{\sqrt{41}}\right) \approx -0{,}8965 \approx -128{,}65°$

(9) $\begin{cases} x = 7 + 8t \\ y = -6 - 10t \end{cases}$ $\vec{S}\{8; -10\}$ $\vec{r}_0\{7; -6\}$



$\frac{x-7}{8} = \frac{y+6}{-10}$

$10x - 70 = 8y + 048$

$10x - 8y - 118 = 0$

(7) $A = \begin{pmatrix} 2 & -2 & 3 & -3 \\ 0 & 2 & -2 & 3 \\ 2 & -2 & 6 & -7 \\ 2 & -4 & 11 & -12 \end{pmatrix}$

$A_{22} = \begin{vmatrix} 2 & -2 & 3 \\ -2 & 6 & -7 \\ +4 & 11 & -12 \end{vmatrix} = \begin{vmatrix} 2 & -2 & 3 \\ 0 & 2 & -2 \\ 0 & 3 & 0 \end{vmatrix} = \begin{vmatrix} 2 & -2 \\ 3 & 0 \end{vmatrix} = 3$

(6) $\begin{bmatrix} 2 & 2 & -2 & -2 & 2 \\ 2 & 2 & -2 & -3 & 2 \\ -2 & 0 & 2 & -2 & 0 \\ -2 & 0 & 2 & 0 & -2 \\ 0 & -4 & 0 & 6 & -2 \end{bmatrix} \sim \begin{bmatrix} 2 & 2 & -2 & -2 & 2 \\ 0 & 2 & 0 & -2 & 2 \\ 0 & 1 & 2 & -3 & 2 \\ 0 & 2 & 0 & -2 & 0 \\ 0 & -4 & 0 & 6 & -2 \end{bmatrix} \sim$

$\sim \begin{bmatrix} 2 & 2 & -2 & -2 & 2 \\ 0 & 2 & 0 & -2 & 0 \\ 0 & 0 & 2 & -2 & 2 \\ 0 & 0 & 0 & -2 & 2 \\ 0 & 0 & 0 & 2 & -2 \end{bmatrix} \sim \begin{bmatrix} 2 & 2 & -2 & -2 & 2 \\ 0 & 2 & 0 & -2 & 0 \\ 0 & 0 & 2 & -2 & 2 \\ 0 & 0 & 0 & -2 & 2 \\ 0 & 0 & 0 & 0 & 2 \end{bmatrix}$ Ответ: 5

(5)
$$\begin{cases}(2-3i)z + (2+3i)w = -3-i \\ (3-2i)z + (2+3i)w = -2-3i\end{cases}$$

$$\left(\begin{array}{cc|c} 2-3i & 3+2i & -3-i \\ 3-2i & 2+3i & -2-3i \end{array}\right)$$

$$\Delta = \begin{vmatrix} 2-3i & 3+2i \\ 3-2i & 2+3i \end{vmatrix} = 4+9-9-4+3-3$$

$$\Delta_z = \begin{vmatrix} -3-i & 3+2i \\ -2-3i & 2+3i \end{vmatrix} = -(2+3i)^2 + (3+2i)(2+3i)$$

$= (2+3i)(3+2i-2-3i) - (2-3i)(2-i) = 2+6i-4$

$+3 = 5+5i$

$$\Delta_w = \begin{vmatrix} 2-3i & -3-i \\ 3-2i & -2-3i \end{vmatrix} = -(3+i)(3-2i) + (2-3i)^2 +$$

$= 2-6i-9 - (9+3i-6i+2) = 2-6i-9-11+3i$

$= -19-3i$

$z = 2+i$

$w = -\frac{19}{5} - \frac{3}{5}i$

$$\Delta_z = \begin{vmatrix} -3-i & 3+2i \\ -2-3i & 2+3i \end{vmatrix} = -3-2i-i+2+3+2i+3i-6$$
$= i-3$

$$\Delta_w = \begin{vmatrix} 2-3i & -3-i \\ 3-2i & -2-3i \end{vmatrix} = -2-2i+3i-9+2-6i+3i-3$$
$= 2-3i$

$z = -\frac{i}{3} + 2$

$w = -\frac{2}{3} + i$

(3) $x^2 - 6x + 4y^2 + 2y + 7 = 0$

$x^2 - 6x + 9 + 4y^2 + 2y + 1/4 - 2{,}25 = 0$

$(x-3)^2 + (2y+\frac{1}{2})^2 = 2{,}25$

$\frac{(x-3)^2}{2{,}25} + \frac{(y+\frac{1}{4})^2}{\frac{2{,}25}{4}} = 1$

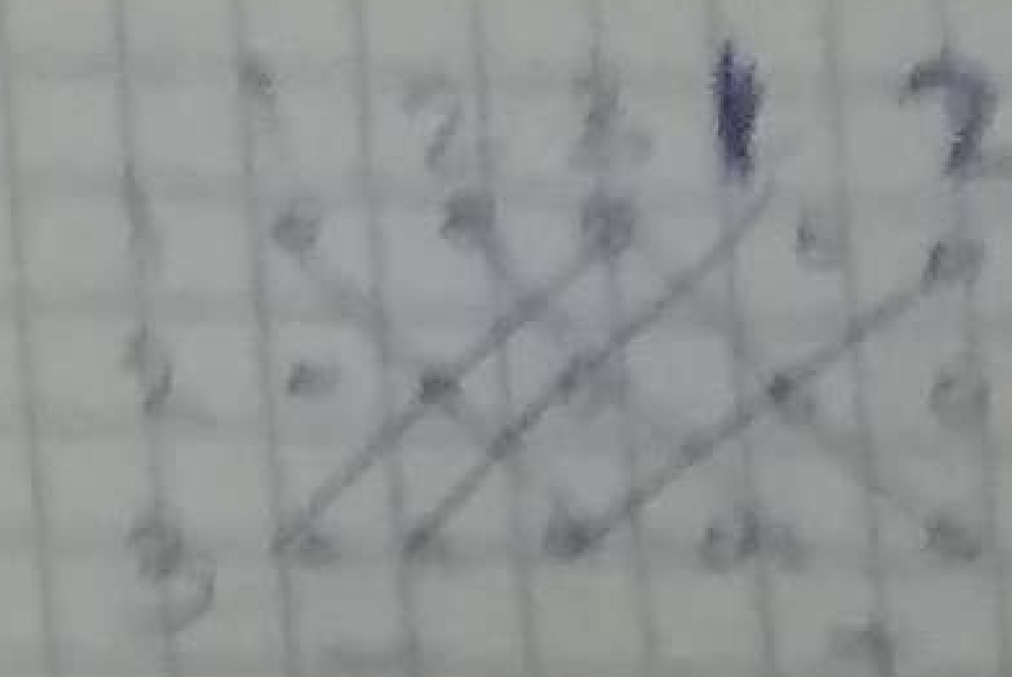
$a = 1{,}5$

$b = 0{,}75$

$(2y + \frac{1}{2})^2 =$

$= 4y^2 + 2y$

(4) $\begin{vmatrix} 7 & x & -7 \\ x & 7 & -8 \\ -8 & -7 & x \end{vmatrix} = 0$



$-8 \quad 49x + 64x + 49x - 392 - 392 + x^3 = 0$

$x^3 - 162x + 784 = 0$

$x^3 - 162x + 784 \mid x-2$

$-x^3 - 2x^2 \qquad x^2 + 8x - 98$

$8x^2 - 162x$

$-8x^2 - 16x$

$-98x + 784$

$-98x + 784$

0

$\Delta = 64 + 392 = 456$

$x = \frac{-8 \pm \sqrt{456}}{2} =$

$= -4 \pm \sqrt{114}$

$6{,}68$

$-14{,}68$