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I) $\dfrac{3-i}{2+i} + i^{11}(-2+3i) \quad \Big| \cdot \dfrac{(2-i)}{(2-i)}$

$$\dfrac{(3-i+i^{11}(-2+3i)(2+i))(2-i)}{5}$$

1) $(3-i)(2-i) = 6-3i-2i+i^2 = 5-5i$

2) $\left(i^{11}(-2+3i)(2+i)\right)(2-i) = -8i^{11}+12i^{12}+2i^{13}-3i^{14}$

$5-6i-8i^{11}+12i^{12}+2i^{13}-3i^{14} = \dfrac{20+5i}{5} = 4+i$

Ответ: $4+i$

$$2z + (5-4i)z - 5i = 0$$

$$a = 2 \quad b = 5-4i \quad c = -5i$$

$$D = b^2 - 4ac = \underset{1}{(5-4i)^2} - \underset{2}{4 \cdot 2 \cdot (-5i)}$$

1) $(5-4i)^2 = 25 - 2 \cdot 5 \cdot 4i + 16i^2 = 9 - 40i$

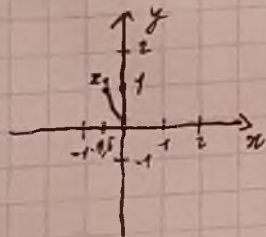2) $-4 \cdot 2 \cdot (-5i) = +40i$

$$D = 9 - 40i + 40i = 9$$

$$z_{1,2} = \frac{-(5-4i) \pm 3}{4}$$

$$z_1 = \frac{-5+4i+3}{4}$$

$$z_1 = \frac{-2}{4} + \frac{4i}{4}$$
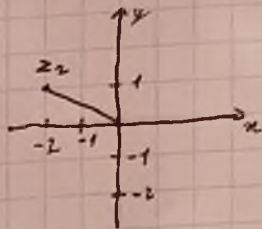
$$z_1 = -0{,}5 + \frac{4i}{4}$$

$$z_1 = -0{,}5 + i$$

$$z_2 = \frac{-5+4i+3}{4}$$

$$z_2 = \frac{-8}{4} + \frac{4i}{4} \quad a \cdot$$

$$z_2 = -2 + \frac{4i}{4}$$

$$z_2 = -2 + i$$

$$\text{Ответ:} \quad z_1 = -0{,}5 + i \qquad z_2 = -2 + i$$

$$\sqrt[4]{16^i} =$$

$x = 0 \qquad y = 0 \qquad |z| = 16$

$$\varphi = \frac{\pi}{2}$$

$$z = 16\left(\cos\frac{\pi}{2} + i\cdot\sin\frac{\pi}{2}\right)$$

~~$z_k = \cdot ij$~~

$$z_k = \sqrt[4]{z} = \sqrt[4]{|z|}\left(\cos\left(\frac{\varphi + 2\pi k}{4}\right) + i\cdot\sin\left(\frac{\varphi + 2\pi k}{4}\right)\right)$$

$K = n - 1 = 0; 1; 2; 3$

$$z_0 = 2\left(\cos\frac{\pi}{8} + i\sin\frac{\pi}{8}\right) = 2e^{\frac{i\pi}{8}}$$

$$z_1 = 2\left(\cos\frac{5\pi}{8} + i\sin\frac{5\pi}{8}\right) = 2e^{\frac{5i\pi}{8}}$$

$$z_2 = 2\left(\cos\frac{9\pi}{8} + i\sin\frac{9\pi}{8}\right) = 2e^{\frac{9\pi i}{8}}$$

$$z_3 = 2\left(\cos\frac{13\pi}{8} + i\sin\frac{13\pi}{8}\right) = 2e^{\frac{13\pi i}{8}}$$

Ответ: $z_0 = 2e^{\frac{i\pi}{8}}$; $z_1 = 2e^{\frac{5i\pi}{8}}$; $z_2 = 2e^{\frac{9\pi i}{8}}$

$$z_3 = 2e^{\frac{13\pi i}{8}}$$

$$x^4 + x^3 - x^2 + x - 2 = (x^2 + ax + b)(x^2 + cx + d)$$

$$x^4 + x^3 = x^2 + 3)$$

$$x^4 + x^3 - x^2 + x - 2 = x^4 + (a+c)x^3 + (b+d+ac)x^2$$
$$+ (ad+bc)x + bd$$

$$a + c = 1 \qquad\qquad a = 1$$
$$b + d + ac = -1 \qquad c = 0$$
$$\qquad\qquad\qquad b + d = -1$$
$$ad + bc = +1 \qquad d = 1$$
$$bd = -2 \qquad\qquad b = -2$$

$$a = 1$$
$$c = 0$$
$$d = 1$$
$$b = -2$$

Ответ: $(x^2 + 1x - 2)(x^2 + 1) = (x-1)(x+2)(x^2+1)$

5) $\dfrac{x^3 + 6x + 1}{x^2 + 2}$

$$
\begin{array}{r|l}
x^3 + 6x^2 + 1 & x^2 + 2 \\
\underline{x^3 + 2x} & x + 6 \\
6x^2 - 2x + 1 & \\
\underline{6x^2 + 12} & \\
-2x - 11 &
\end{array}
$$

уел : $x + 6$ остаток $-2x - 11$

6) $\dfrac{2x^2-4}{x^3-4x} = \dfrac{A}{x^3} + \dfrac{B}{x^2} + \dfrac{C}{x} + \dfrac{D}{x} = \dfrac{Ax^2x + Bxx + Cx + Dx^3}{x^3-4x} =$

$2x^2-4 = Ax^2x + Bxn + Cx + Dx^3$

x^3 $A+D=0$

x^2 $B=2$

x $C=0$

$A=0$ $B=2$ $C=0$

$\dfrac{2x^2-4}{x^3-4x} = \dfrac{0}{x} + \dfrac{2}{x^2} + \dfrac{0}{x^3} + \dfrac{D}{x}$