

## ДОМАШНА РАБОТА №1

1) Пресметнете:

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|-----------------------|-----------------------|----------------------|
| 1.1. $(1+2i)(3-2i)$ ; | 1.2. $(1+3i)(4+2i)$ ; | 1.3. $(4-5i)(1-i)$ ; |
| 1.4. $(3-2i)(3+i)$ ;  | 1.5. $(5-i)(2+4i)$ ;  | 1.6. $(3+i)(5+i)$ ;  |
| 1.7. $(1-i)(4+3i)$ ;  | 1.8. $(7-i)(1+5i)$ ;  | 1.9. $(2-i)(4-i)$ ;  |
| 1.10. $(5+i)(2-7i)$ . |                       |                      |

2) Пресметнете:

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|----------------------|-----------------------|-----------------------|
| 2.1. $(5+i)(5-i)$ ;  | 2.2. $(5+2i)(5-2i)$ ; | 2.3. $(3+2i)(3-2i)$ ; |
| 2.4. $(6+i)(6-i)$ ;  | 2.5. $(1-3i)(1+3i)$ ; | 2.6. $(4-3i)(4+3i)$ ; |
| 2.7. $(1+i)(1-i)$ ;  | 2.8. $(1+4i)(1-4i)$ ; | 2.9. $(2-5i)(2+5i)$ ; |
| 2.10. $(2-i)(2+i)$ . |                       |                       |

3) Пресметнете:

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|------------------------------|-----------------------------|---------------------------|---------------------------|
| 3.1. $\frac{13-13i}{2-3i}$ ; | 3.2. $\frac{9+19i}{5-i}$ ;  | 3.3. $\frac{5-5i}{3+i}$ ; | 3.4. $\frac{5i}{1+2i}$ ;  |
| 3.5. $\frac{5-5i}{2-i}$ ;    | 3.6. $\frac{1+7i}{1+2i}$ ;  | 3.7. $\frac{-10i}{3-i}$ ; | 3.8. $\frac{9-2i}{4+i}$ ; |
| 3.9. $\frac{7-11i}{1-3i}$ ;  | 3.10. $\frac{7+4i}{2+3i}$ . |                           |                           |

4) Пресметнете:

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|-------------------------------------------------|--------------------------------------------------|--------------------------------------------------|
| 4.1. $z = \frac{5i}{2+i} - \frac{3-2i}{2+3i}$ ; | 4.2. $z = \frac{3-i}{1+3i} - \frac{7+4i}{2-i}$ ; | 4.3. $z = \frac{5-i}{1+5i} - \frac{4-2i}{1-i}$ ; |
| 4.4. $z = \frac{1-i}{1+i} - \frac{7+6i}{4+i}$ ; | 4.5. $z = (2-3i) \cdot \frac{5-5i}{1-3i}$ ;      | 4.6. $z = (7-i) \cdot \frac{4+22i}{1+3i}$ ;      |
| 4.7. $z = (1+4i) \cdot \frac{6-7i}{2+i}$ ;      | 4.8. $z = (1+2i) \cdot \frac{11+10i}{2+3i}$ ;    | 4.9. $z = \frac{(5+i)^2}{3-2i}$ ;                |
| 4.10. $z = \frac{(3-i)^2}{1+i}$ .               |                                                  |                                                  |

5) Пресметнете:

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|-----------------|-----------------|-----------------|-----------------|------------------|
| 5.1. $i^{10}$ ; | 5.2. $i^{20}$ ; | 5.3. $i^{32}$ ; | 5.4. $i^{38}$ ; | 5.5. $i^{12}$ ;  |
| 5.6. $i^{18}$ ; | 5.7. $i^{24}$ ; | 5.8. $i^{34}$ ; | 5.9. $i^{52}$ ; | 5.10. $i^{44}$ . |

6) Пресметнете:

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|-----------------|-----------------|-----------------|-----------------|------------------|
| 6.1. $i^{15}$ ; | 6.2. $i^{17}$ ; | 6.3. $i^9$ ;    | 6.4. $i^7$ ;    | 6.5. $i^{23}$ ;  |
| 6.6. $i^{31}$ ; | 6.7. $i^{39}$ ; | 6.8. $i^{27}$ ; | 6.9. $i^{13}$ ; | 6.10. $i^{51}$ . |

7) Пресметнете:

$$\begin{array}{llll}
 7.1. \left(\frac{1+4i}{4-i}\right)^8; & 7.2. \left(\frac{3-i}{1+3i}\right)^7; & 7.3. \left(\frac{3+2i}{2-3i}\right)^{16}; & 7.4. \left(\frac{5+i}{1-5i}\right)^{11}; \\
 7.5. \left(\frac{2-5i}{5+2i}\right)^{10}; & 7.6. \left(\frac{1+6i}{6-i}\right)^5; & 7.7. \left(\frac{1+2i}{2-i}\right)^{14}; & 7.8. \left(\frac{3-4i}{4+3i}\right)^{13}; \\
 7.9. \left(\frac{1-i}{1+i}\right)^{12}; & 7.10. \left(\frac{2+7i}{7-2i}\right)^5.
 \end{array}$$

8) Приведете числото в тригонометричен вид:

$$\begin{array}{llll}
 8.1. z = 1 + \sqrt{3}i; & 8.2. z = 1 - \sqrt{3}i; & 8.3. z = -1 - \sqrt{3}i; & 8.4. z = \sqrt{3} + i; \\
 8.5. z = 1 + i; & 8.6. z = 1 - i; & 8.7. z = -1 + i; & 8.8. z = -1 - i; \\
 8.9. z = -\sqrt{3} + i; & 8.10. z = \sqrt{3} - i.
 \end{array}$$

9) Пресметнете:

$$\begin{array}{llll}
 9.1. z = (1+i)^6; & 9.2. z = (1-i)^8; & 9.3. z = (-1+i)^4; & 9.4. z = (-1-i)^{10}; \\
 9.5. z = (1+\sqrt{3}i)^6; & 9.6. z = (1-\sqrt{3}i)^3; & 9.7. z = (-1-\sqrt{3}i)^4; & 9.8. z = (\sqrt{3}+i)^{12}; \\
 9.9. z = (-\sqrt{3}-i)^6; & 9.10. z = (-1+\sqrt{3}i)^{12}.
 \end{array}$$

10) Пресметнете:

$$\begin{array}{llll}
 10.1. \left(\frac{-1+5i}{2+3i}\right)^4; & 10.2. \left(\frac{3-i}{1-2i}\right)^8; & 10.3. \left(\frac{5+3i}{1+4i}\right)^6; & 10.4. \left(\frac{7+3i}{2+5i}\right)^{10}; \\
 10.5. \left(\frac{-5+3i}{4+i}\right)^{12}; & 10.6. \left(\frac{-4+6i}{5-i}\right)^8; & 10.7. \left(\frac{-1-3i}{2+i}\right)^4; & 10.8. \left(\frac{-5-i}{3-2i}\right)^{10}; \\
 10.9. \left(\frac{-2+4i}{1+3i}\right)^{12}; & 10.10. \left(\frac{6-4i}{1-5i}\right)^6.
 \end{array}$$

11) Пресметнете:

$$\begin{array}{lllll}
 11.1. \sqrt[3]{8}; & 11.2. \sqrt[3]{-8}; & 11.3. \sqrt[3]{8i}; & 11.4. \sqrt[3]{-8i}; & 11.5. \sqrt[3]{27}; \\
 11.6. \sqrt[3]{-27}; & 11.7. \sqrt[3]{27i}; & 11.8. \sqrt[3]{-1}; & 11.9. \sqrt[3]{i}; & 11.10. \sqrt[3]{-i}.
 \end{array}$$

12) Пресметнете:

$$\begin{array}{lllll}
 12.1. \sqrt[4]{16i}; & 12.2. \sqrt[4]{-16i}; & 12.3. \sqrt[4]{-16}; & 12.4. \sqrt[4]{16}; & 12.5. \sqrt[4]{1}; \\
 12.6. \sqrt[4]{i}; & 12.7. \sqrt[4]{-i}; & 12.8. \sqrt[4]{81}; & 12.9. \sqrt[4]{81i}; & 12.10. \sqrt[4]{-81i}.
 \end{array}$$