

**ALGEBRA**  
**Midterm Test.**

Name: \_\_\_\_\_

Student Number: \_\_\_\_\_

Version of the test: \_\_\_\_\_

---

1. (2p.) Using the Cartesian form of complex numbers, compute

$$\sqrt{2+i}.$$

2. (1p.) Give a complex polynomial of degree 3 with integer coefficients such that  $z_1 = \frac{1}{3}$ ,  $z_2 = 1 + \sqrt{3}i$  are two of its roots.

3. (2p.) Decompose  $\frac{x^2-x+1}{(x^2-1)(x+2)}$  into a sum of real partial fractions.

4. (1p.) Find the inverse matrix

$$\begin{pmatrix} 2 & -1 \\ 3 & -3 \end{pmatrix}^{-1}$$

5. (2p.) Solve the system of linear equations

$$\begin{cases} x + y - 3z = 1 \\ 2x + 3y - z = 2 \end{cases} .$$

---