

ALGEBRA

Midterm Test.

Name: _____

Student Number: _____

Version of the test: _____

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

$$\sqrt{3 + 2i}.$$

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

3. (2p.) Decompose $\frac{x^2+1}{(x^2-9)(x+5)}$ into a sum of real partial fractions.

4. (1p.) Find the inverse matrix

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

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

$$\begin{cases} x - y + 5z = 1 \\ 3x + y + 2z = -1 \end{cases} .$$
