Excercises
Matematics A1a
Complex Numbers

1. Give the trigonometric form of the complex numbers:

$$z_1 = -\frac{1}{2}, z_2 = -1 + i, z_3 = \sqrt{3} - i, .$$

$$z_1 \cdot \bar{z}_3,$$

2. Give the algebraic form of the complex numbers:

$$z = 3\left(\cos\frac{5\pi}{6} + i\sin\frac{5\pi}{6}\right), z = \frac{1}{\sqrt{2}}\left(\cos\frac{10\pi}{3} + i\sin\frac{10\pi}{3}\right), z = 25(\cos 3\pi + i\sin 3\pi).$$

3. Find in algebraic form:

$$z = \left(-1 + i\sqrt{3}\right)^{10}, z = (1-i)^6, z = \sqrt[3]{-8i}, z = \sqrt[4]{i}\,.$$

4. Solve the following complex equations:

a.) $(z-i)(4-i) = 10i - 6,$

b.) $(1-i)^{-8} = iz,$

c.) $z^3 + 16z = 0,$

d.) $z^5 + 32 = 0,$

e.) $\frac{1+i}{1-i} = (1-z)^3,$

f.) $z^2 - 4z + 10 = 0,$

g.) $z^2 + iz + \frac{\sqrt{3}}{4}i = 0.$