Foglio di esercizi 1

Esercizio 1   Scrivere in forma algebrica i seguenti numeri complessi:

(a) $z = (1 + i)^{10}$

(b) $z = (1 - i)(2 + i)$

(c) $z = 3e^{\frac{5}{6}\pi i}$

(d) $z = \frac{(\sqrt{2}i + \sqrt{3})^3}{\sqrt{2} - \sqrt{3}i}$

(e) $z = \frac{(1+i)^{10}}{(1-i)^8}$

(f) $z = (i)^{2014}$

Esercizio 2   Scrivere in forma trigonometrica i seguenti numeri complessi:

(a) $z = \sqrt{3} - i$

(b) $z = \sqrt[3]{i - 1}$

(c) $z = \left(\frac{i-1}{i+1}\right)^3$

(d) $z = \frac{4i}{\sqrt{3}+i}$

(e) $z = \left(\frac{i+\sqrt{3}}{i(\sqrt{3}-i)}\right)^{22}$

(f) $z = e^{-\frac{\pi}{2}i} + e^{-i\frac{\pi}{6}}$

Esercizio 3   Trovare tutte le soluzioni complesse delle seguenti equazioni:

(a) $z^5 = \frac{\sqrt{3}-i}{\sqrt{3}+i}$

(b) $z^3 = \frac{i-1}{i+1}$

(c) $z^4 = 1$

(d) $z^3 = \frac{(i-1)^4}{(i+1)^2}$

(e) $z^2 = \frac{-2+2\sqrt{3}i}{\sqrt{3}-i}$

(f) $z^3 = \frac{\sqrt{3}-i}{-2+2\sqrt{3}i}$

(g) $z^4 = \frac{-2-2\sqrt{3}i}{\sqrt{3}+i}$

(h) $z^5 = \frac{\sqrt{3}+i}{-2-2\sqrt{3}i}$

(i) $z^2 = \frac{3i}{i+1}$

(l) $z^3 = \frac{-2i}{i-1}$

(m) $z^4 = \frac{3i}{\sqrt{3}i+1}$

(n) $z^4 = \frac{5i}{\sqrt{3}-i}$