

$$i = \sqrt{-1}$$

Imaginary unit

$$z = a + bi$$

Complex number z

$$\bar{z} = a - bi$$

Complex conjugate

$$a = \operatorname{Re}(a + bi)$$

Real part

$$b = \operatorname{Im}(a + bi)$$

Imaginary part

$$(a + bi) + (c + di) = (a + c) + (b + d)i$$

Addition

$$(a + bi) \cdot (c + di) = (ac - bd) + (ad + bc)i$$

Multiplication

$$\frac{a + bi}{c + di} = \frac{(ac + bd) + (bc - ad)i}{c^2 + d^2}$$

Division

$$|z| = \sqrt{a^2 + b^2}$$

Absolute value, Modulus

$$\arg(z) = \tan^{-1}(b/a) = \theta$$

Argument

$$z\bar{z} = |z|^2$$

Modulus squared

$$e^{i\theta} = \cos(\theta) + i \sin(\theta)$$

Euler's Formula

$$z = |z|[\cos(\theta) + i \sin(\theta)]$$

Polar form I

$$z = |z|e^{i\theta}$$

Polar form II