

5.6 Square root of a complex number

Let $z = a + ib$ be a complex number,

$$\begin{aligned}\text{Then } \sqrt{a+ib} &= \pm \left[\sqrt{\frac{|z|+a}{2}} + i \sqrt{\frac{|z|-a}{2}} \right], \text{ for } b > 0 \\ &= \pm \left[\sqrt{\frac{|z|+a}{2}} - i \sqrt{\frac{|z|-a}{2}} \right], \text{ for } b < 0.\end{aligned}$$

To find the square root of $a - ib$, replace i by $-i$ in the above results.