

Complexe getallen

m.laarhoven

Antwoorden

Herschrijf tot in de vorm $a+ib$, met $a \in \mathbb{R}$ en $b \in \mathbb{R}$

$$1. \frac{2-i}{1+i} = \frac{2-i}{1+i} \cdot \frac{1-i}{1-i} = \frac{1-3i}{2} = \frac{1}{2} - \frac{3}{2}i$$

$$2. (-1+i)(-1+3i) = 1-3i-i-3 = -2-4i$$

$$3. \frac{2i}{-1+i} = \frac{2i}{-1+i} \cdot \frac{-1-i}{-1-i} = \frac{-2i+2}{2} = 1-i$$

$$4. (-\sqrt{3}+i)(-\sqrt{3}+i) = 3-2i\sqrt{3}-1 = 2-2i\sqrt{3}$$

$$5. \frac{-1+i\sqrt{3}}{2-i} = \frac{-1+i\sqrt{3}}{2-i} \cdot \frac{2+i}{2+i} = \frac{-2-i+2i\sqrt{3}-\sqrt{3}}{5} = \frac{-2-\sqrt{3}}{5} + i \cdot \frac{-1+2\sqrt{3}}{5}$$

$$6. \frac{5}{1-i\sqrt{3}} = \frac{5}{1-i\sqrt{3}} \cdot \frac{1+i\sqrt{3}}{1+i\sqrt{3}} = \frac{5+5i\sqrt{3}}{4} = \frac{5}{4} + i \cdot \frac{5\sqrt{3}}{4}$$

$$7. (-3+3i)(-2-4i) = 6+12i-6i-12 = -6+6i$$

$$8. \frac{2-2i}{\sqrt{3}+i} = \frac{2-2i}{\sqrt{3}+i} \cdot \frac{\sqrt{3}-i}{\sqrt{3}-i} = \frac{2\sqrt{3}-2i-2i\sqrt{3}-2}{4} = \frac{2\sqrt{3}-2}{4} + i \cdot \frac{-2-2\sqrt{3}}{4}$$

$$9. (-3+3i)(1+i) = -3-3i+3i-3 = -6$$

$$10. \frac{2+2\sqrt{3}i}{1-i} = \frac{2+2\sqrt{3}i}{1-i} \cdot \frac{1+i}{1+i} = \frac{2+2\sqrt{3}i+2i-2\sqrt{3}}{2} = \frac{2-2\sqrt{3}}{2} + i \cdot \frac{2-2\sqrt{3}}{2}$$

$$11. \frac{2}{\sqrt{3}+2i} = \frac{2}{\sqrt{3}+2i} \cdot \frac{\sqrt{3}-2i}{\sqrt{3}-2i} = \frac{2\sqrt{3}-4i}{7} = \frac{2\sqrt{3}}{7} + i \cdot \frac{-4}{7}$$

$$12. (-1+3i)^2 = 1-6i-9 = -8-6i$$

$$13. (1-2i)^3 = (1-2i)(1-4i-4) = (1-2i)(-3-4i) = -3-4i+6i-12 = -15+2i$$

$$14. \frac{3}{-2+i} = \frac{3}{-2+i} \cdot \frac{-2-i}{-2-i} = \frac{-6-3i}{5} = \frac{-6}{5} + i \cdot \frac{-3}{5}$$

$$15. (1+i)^4 = (2i)(2i) = -4$$