

Math 120A
August 6, 2019

Question 1 A complex number is a

- A. point in the complex plane \mathbb{C} .
- B. number of the form $x + iy$ with $x, y \in \mathbb{R}$ and $i^2 = -1$.
- C. number of the form $z = e^{\log(r)+i\theta}$ with $r = |z|$.
- D. **A** and **B**.
- *E. **A**, **B**, and **C**.

Question 2 Stereographic projection is a one-to-one correspondence between

- A. \mathbb{C} , the complex plane and $S \setminus \{(0, 0, 1)\}$, the unit sphere minus the north pole.
- B. $\mathbb{C}^* = \mathbb{C} \cup \{\infty\}$, the extended complex plane and S , the unit sphere.
- C. \mathbb{R}^3 , 3-dimensional space and $\mathbb{C}^2 = \{(z, w) \mid z, w \in \mathbb{C}\}$, the set of ordered pairs of complex numbers.
- *D. **A and B**
- E. **A, B, and C**

Question 3 How can you tell i and $-i$ apart?

- *A. You can't. They're both outside the real number system and satisfy the defining relationship $i^2 = (-i)^2 = -1$.
- B. It's easy. Just look for the minus sign.
- C. $-i$ is the conjugate of i .
- D. **B** and **C**
- E. Why bother? They're both purely imaginary.