Q1: Is the statement “this statement is false” an admissible statement, i.e., does it fulfill the requirements of the definition?

Yes

No

For Q1 and Q2, the statements \( A(n) \), \( B(n) \), \( C(n) \), and \( D(n) \) are that \( n \) is divisible by \( 2, 3, 4, \) and \( 6 \) respectively.

Q2: \( A(n) \land B(n) \) must

\( C(n) \)

\( D(n) \)

Q3: \( A(n) \lor C(n) \) must

\( A(n) \land D(n) \)

Q4: Which of the following pictures could be the graph of a function?

Both

The left figure

The right figure

Neither

Q5: \( B(z^2 - 3 - i\lambda) = \text{Re}(z^2 - i\lambda(3 - i\lambda)) \)

True

False

Q6: (Multiple): For every complex number \( z = x + iy \) it is true that

\[ z^2 = x^2 - y^2 + 2ixy \]

\[ z^3 = x^3 + 3x^2y + 3xy^2 + iy^3 \]

\[ e^z = e(x + iy) \]

\[ z = \bar{z} \]

Don’t know.

Q7: For every complex number \( z = x + iy \) it is \( \text{Re}(z) = \)

\( x \)

\( x + iy \)

\( x - iy \)

Don’t know.

Q8: Which number is the complex conjugate of \( z \)?

\( z \)

\( z^2 \)

\( z^3 \)

Q9: Which point belongs to \( k/z \) for \( z \neq 0 \)?

\( y = \text{Re}(z) \)

\( x = \text{Im}(z) \)

\( y = \text{Im}(z) \)

\( x = \text{Re}(z) \)

Q10: For a given complex \( n \) let \( M \) be the set \( M = \{ z \in \mathbb{C} \mid |z - m| = 1 \} \). Then \( M \) describes a circle with radius 1 and center \( m \).

This statement is correct.

This statement is false.

Q11: What is the geometrical meaning of the mapping \( D: \mathbb{C} \rightarrow \mathbb{C} \) such that \( z \rightarrow -iz \)?

Mirrored at the \( x \)-axis

Mirrored at the \( y \)-axis

Counter-clockwise rotation by \( \pi/2 \)

Clockwise rotation by \( \pi/2 \)

Q12: Let \( x \) be a complex number with absolute value 1 and argument \( \phi \). For which \( \phi \) is \( x \) located in the second quadrant?

\( -\pi/3 \)

\( -\pi/6 \)

\( -\pi/4 \)

\( -\pi/3 \)

Q13: With \( \lambda = -3 - 4i \), its argument is ...

\( \theta \) such that \( \sin(\theta) < \theta / 2 \)

\( -\pi / 2 \) \( < \) \( \sin(\theta) \) \( < \) \( \pi / 2 \)

\( -\pi / 4 \) \( < \) \( \sin(\theta) \) \( < \) \( \pi / 4 \)

Q14: With \( \lambda = 1 + i \), for which \( y \) is the argument of \( \lambda \) negative?

\( y = -1 \)

\( y = 0 \)

\( y = 1 \)

\( y = 2 \)

Q15: The argument of the complex number \( z = \cos(\theta) - i \sin(\theta) \) is ...

\( \theta \)\( / 2 \)

\( \theta \)

\( \theta / 2 \)

\( \theta \)

Q16 (multiple): Let \( x \) be a complex number \( x = a + iy \) with absolute value 1 and angle \( \phi \). For which \( \phi \) is \( x \) located in the third quadrant?

\( \phi = \pi / 3 \)

\( -\pi / 3 \)

\( -\pi / 4 \)

\( -\pi / 2 \)

Q17 (multiple): With \( \lambda = x - i \), for which \( x \) is the argument of \( \lambda \) negative?

\( x = -1 \)

\( x = 0 \)

\( x = 1 \)

\( x = 2 \)

Q18: What is the real part of \( e^{-i\pi} \)?

\( 1 \)

\( -1 \)

\( \cos(1) \)

\( \sin(1) \)

Q19: The statement \( |e^{i\phi}| = 1 \) for all \( \phi \) is ...

true

false