Exploring the relationship between the Argument and Modulus when multiplying complex numbers

Follow this link to answer the questions below: https://www.geogebra.org/classic/bmedez74

How do we find the Argument of a complex number?

What do you notice about the Arguments when 2 complex numbers are multiplied?

How do we find the modulus of a complex number?

What do you notice about the moduli when 2 complex numbers are multiplied?

What do you think would happen if we were to multiply a complex number by itself?

What would happen if we were to cube that complex number?

Can you see a pattern? (click on the button to reveal exponents of z)

The effect of multiplying a complex number by itself (complete the table):

Multiplication of a complex number	Argument (angle θ)	Modulus (r)
$z \times z = z^2$	Double the argument (2θ)	Square the modulus (r^2)
$z \times z \times z =$		
z^n		

The effect of multiplying a complex number by itself:

Multiplication	Argument (angle θ)	Modulus (r)
z x z = z^2	Doubled (2θ)	Squared (r^2)
z x z x z = z^3	Tripled (3θ)	Cubed (r^3)
z x z x z x z = z^4	Multiplied by 4 (4θ)	Multiplied by itself 4 times (r^4)
z x z x z x z x z = z^5	Multiplied by 5 (5θ)	Multiplied by itself 5 times (r^5)
z^n	Multiplied by n (nθ)	Multiplied by itself n times (r^n)

De Moivre's theorem: $z^n = r^n(\cos n\theta + i\sin n\theta)$