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### 0.1 De Moivre's formula

$$e^{i\theta} = \cos(\theta) + i \sin(\theta)$$

Let  $\theta = nx$ :

$$e^{inx} = \cos(nx) + i \sin(nx)$$

$$(e^{ix})^n = \cos(nx) + i \sin(nx)$$

$$(\cos(x) + i \sin(x))^n = \cos(nx) + i \sin(nx)$$