TOPIC: POWERS OF i

- Recall: $\boldsymbol{i} = \sqrt{-\mathbf{1}}$. Many problems will have $\boldsymbol{i}$ raised to the 2nd, 3rd, or even much higher powers!
  - All properties of exponents can be applied to powers of $\boldsymbol{i}$

POWERS OF i	
$i^1 =$ ⟶ ____	$i^5 =$ ______ = ______ = ____
$i^2 =$ ⟶ ______ = ____	$i^6 =$ ______ = ______ = ____
$i^3 =$ ______ = ______ = ____	$i^7 =$ ⟶ ____
$i^4 =$ ______ = ______ = ____	$i^8 =$ ⟶ ____

  - ***Any*** power of $\boldsymbol{i}$ can ***ALWAYS*** be simplified to ___, ___, ___ or ___

How To Evaluate Higher Powers of i

- We can express powers of $\boldsymbol{i}$ in terms of _____.

EXAMPLE: Simplify the power of $\boldsymbol{i}$.

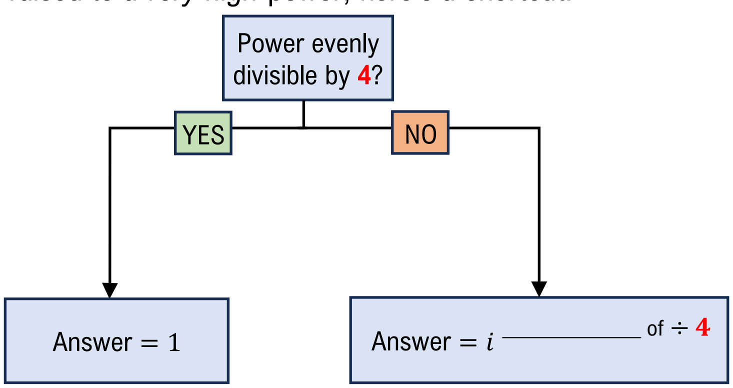
$(\boldsymbol{A})$

$$i^{20} = i^4 \cdot i^4 \cdot i^4 \cdot i^4 \cdot i^4$$
$$= 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1$$
$$=$$

$(\boldsymbol{B})$

$$i^{22} = \underbrace{i^4 \cdot i^4 \cdot i^4 \cdot i^4 \cdot i^4}_{} \cdot i^2$$
$$=$$
$$=$$

- To evaluate $\boldsymbol{i}$ raised to a *very high* power, here's a shortcut:



Remainders of i
$i^1 = i$
$i^2 = -1$
$i^3 = -i$

EXAMPLE: Simplify the power of $\boldsymbol{i}$.

$(\boldsymbol{A})$ i^{100}

$(\boldsymbol{B})$ i^{22}

$(\boldsymbol{C})$ i^{67}

TOPIC: POWERS OF i

PRACTICE: Simplify the power of i.

i^{1003}

Remainders of i
$i^1 = i$
$i^2 = -1$
$i^3 = -i$

PRACTICE: Simplify the power of i.

i^{85}