Topic: Complex numbers

Question: Simplify the imaginary number.

$$i^{1,343}$$

Answer choices:

A i

B -1

C $-i$

D 1

Solution: C

We need to look for the largest number less than or equal to $1{,}343$ that's divisible by 4. $1{,}343$ isn't divisible by 4, so we try $1{,}342$, then $1{,}341$, then $1{,}340$. $1{,}340$ is the first number we come to that's divisible by 4, so we separate the exponent.

$$i^{1{,}343}$$

$$i^{1{,}340+3}$$

$$i^{1{,}340}i^{3}$$

Rewrite $1{,}340$ as a power of 4.

$$(i^{4})^{335}i^{3}$$

We know that i^4 is always 1, so

$$(1)^{335}i^{3}$$

$$1i^{3}$$

$$i^{3}$$

We know that i^3 is equal to $-i$, so

$$i^{1{,}343} = -i$$

Topic: Complex numbers

Question: Name the imaginary part of the complex number.

$$z = 2 - 11i$$

Answer choices:

A 2

B 11

C -11

D $-11i$

Solution: C

For a complex number in the form $z = a + bi$, a is always the real part and b is always the imaginary part. If b is negative, you have to remember to include the negative sign when you name the imaginary part. So in the complex number $z = 2 - 11i$, 2 is the real part, and -11 is the imaginary part.

Topic: Complex numbers

Question: How can the number be classified?

$$z = 0 - 4i$$

Answer choices:

A Complex number

B Real number

C Pure imaginary number

D Both A and C

Solution: D

Every real number and every imaginary number is also a complex number. Because the number simplifies as

$$z = 0 - 4i$$

$$z = -4i$$

and the real part disappears, it can be classified as a pure imaginary number. But as a pure imaginary number, it's also automatically a complex number.