Name



Complex Numbers - Geometric Representation

1 Classify this number as natural, whole, integer, rational, irrational, imaginary, or complex. Pick the narrowest definition that fits.

$$3+\frac{53i}{3}$$

A	Irrational Number
B	Real Number
C	Complex Number
D	Natural Number

2 Select the number that is a rational number

Rational Number

A	$4+\frac{13i}{5}$
B	$\frac{4}{7}$
C	$3+83i$

3 Select the description that matches a natural number

Natural Number

A	A number that can be expressed as a real number multiplied by the imaginary unit i (e.g., -2.5i).
B	A number that has a real and an imaginary part (e.g. 3 + 4i).
C	Any number that can be expressed as a fraction of two integers (e.g., 1/2, -3/4, 5).
D	A positive integer (1, 2, 3, ...).

4 Select the narrowest description that matches this number type

$$\sqrt{59}$$

A	A positive integer (1, 2, 3, ...).
B	Any number that can be expressed as a fraction of two integers (e.g., 1/2, -3/4, 5).
C	A number that can be expressed as a real number multiplied by the imaginary unit i (e.g., -2.5i).
D	A real number that cannot be expressed as a simple fraction (e.g., √2, π).

5 Select the number type that matches this description

A real number that cannot be expressed as a simple fraction (e.g., √2, π).

A	Natural Number
B	Irrational Number
C	Rational Number
D	Whole Number

6 Classify this number as natural, whole, integer, rational, irrational, imaginary, or complex. Pick the narrowest definition that fits.

$$\frac{42}{7}$$

A	Natural Number
B	Irrational Number

7 Select the number that is a whole number

Whole Number

A	$\frac{\sqrt{23}\,i}{2}$
B	$\sqrt{89}\,i$
C	$\frac{0}{5}$

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8 Select the number that matches this description

Any number that can be expressed as a fraction of two integers (e.g., 1/2, -3/4, 5).

A $-\frac{4}{9}$

B $\frac{73i}{5}$

C $\sqrt{31}$

9 Select the description that matches a pure imaginary number

Pure Imaginary Number

A A number that can be expressed as a real number multiplied by the imaginary unit i (e.g., -2.5i).

B A positive integer (1, 2, 3, ...).

C Any number that can be found on the number line, including both rational and irrational numbers.

D Any number that can be expressed as a fraction of two integers (e.g., 1/2, -3/4, 5).

10 Select the narrowest description that matches this number type

$$0.\overline{12}$$

A A real number that cannot be expressed as a simple fraction (e.g., √2, π).

B A positive integer (1, 2, 3, ...).

C Any number that can be expressed as a fraction of two integers (e.g., 1/2, -3/4, 5).

D A non-negative integer (0, 1, 2, 3, ...).

11 Is this number a complex number (even if that's not it's narrowest type)?

$$\text{Is } \frac{1}{4} \text{ a complex number}$$

A Yes

B No

12 Select the number type that matches this description

A non-negative integer (0, 1, 2, 3, ...).

A Irrational Number

B Natural Number

C Whole Number

13 Select the number that matches this description

A positive integer (1, 2, 3, ...).

A $\frac{\sqrt{2}\,i}{3}$

B $\sqrt{73}\,i$

C $\sqrt{\frac{36}{4}}$

14 Is a whole number also a pure imaginary number?

A Always

B Sometimes

C Never

15 Is this number an integer (even if that's not it's narrowest type)?

$$\text{Is } \frac{\sqrt{73}\,i}{3} \text{ an integer}$$

A Yes

B No

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Complex Numbers - Geometric Representation

16 Is a pure imaginary number also a complex number?

A: Always

B: Never

C: Sometimes

17 What is the modulus of this complex number?

$$|3-5i|$$

A: 8

B: $\sqrt{34}$

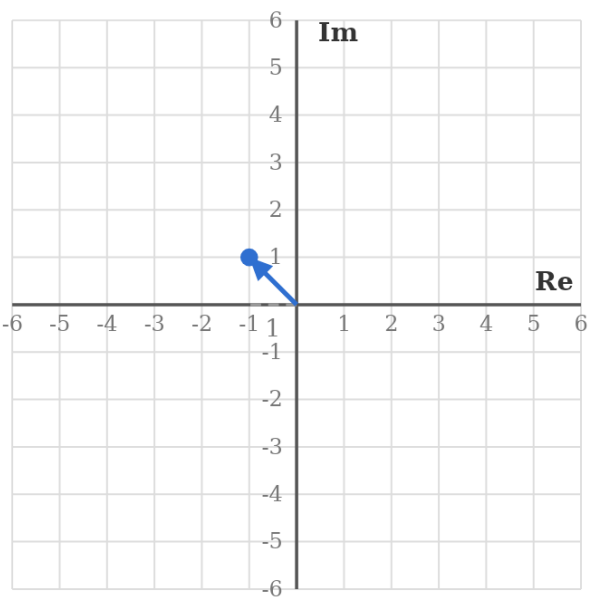
C: 4

D: $\sqrt{37}$

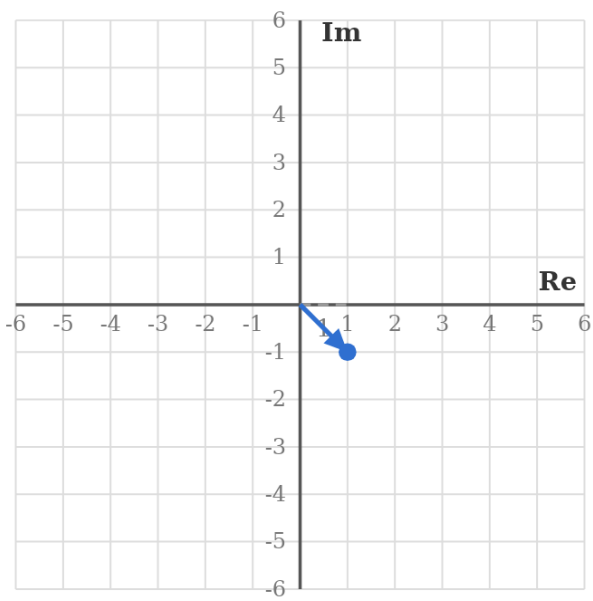
18 Which diagram correctly shows the modulus of this number as a distance from the origin?

$$1-i$$

A



B



19 Which expression gives the modulus of this complex number, before simplifying?

$$|1-2i|$$

A: $\sqrt{1^2-(-2)^2}$

B: $1^2+(-2)^2$

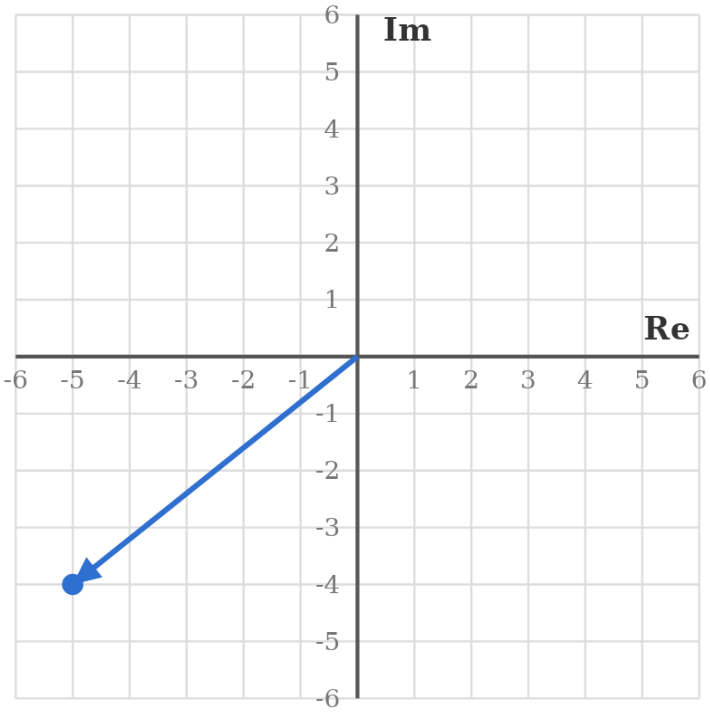
C: $\sqrt{1^2+(-2)^2}$

D: $\sqrt{1+-2}$

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Complex Numbers - Geometric Representation

20 What is the modulus of the plotted complex number?



A $\sqrt{41}$

B $\sqrt{46}$

C 9

D 3

21 A complex number z has |z| = 2 and lies on the imaginary axis. What are the possible values of z?

A complex number z has modulus |z| = 2 and lies on the imaginary axis.

A $2i$ or $-2i$

B $2i$

C $2i$ or 2

D 2 or -2

22 What is the complex conjugate of this number?

$\overline{6+3i}$

A $-6+3i$

B $-6-3i$

C $6-3i$

D $6+3i$

23 Which point on the complex plane represents this number?

$6+6i$

A (6, 6)

B (6, -6)

C (-6, 6)

24 A complex number is plotted at (-6, -2). Which number is it?

A complex number is plotted at the point (-6, -2).

A $-6+2i$

B $-2-6i$

C $6-2i$

D $-6-2i$

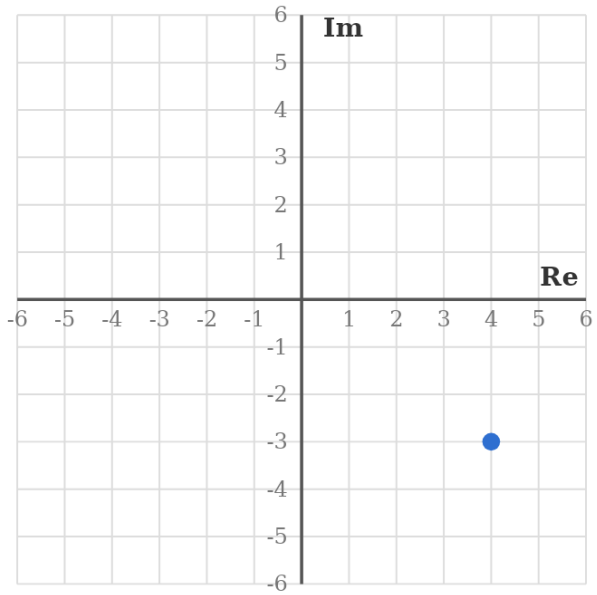
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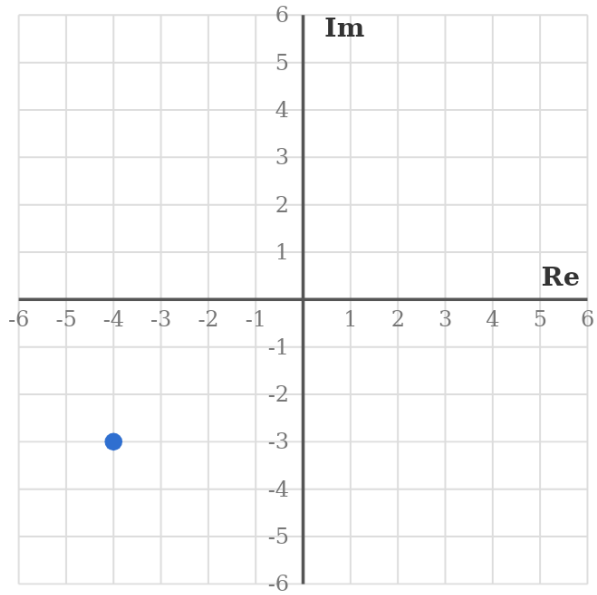
25 Which graph plots the conjugate of this number?

$$\overline{-4+3i}$$

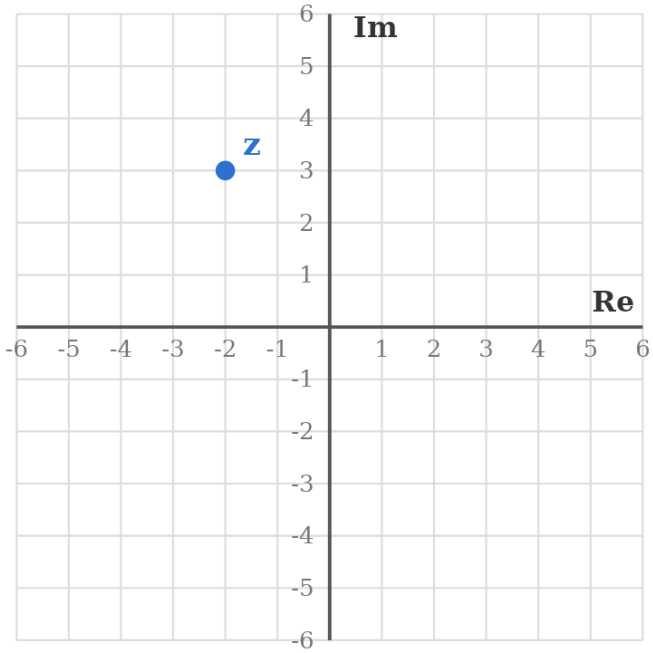
A



B



26 The conjugate of the plotted number z is which expression?



A

$-2-3i$

B

$2-3i$

C

$-2+3i$

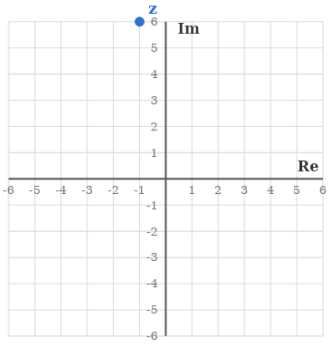
D

$2+3i$

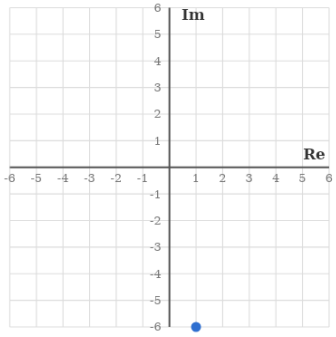
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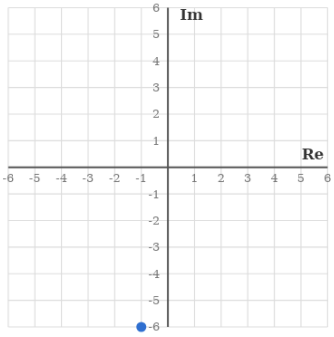
27 Which graph shows the conjugate of the plotted number z?



A



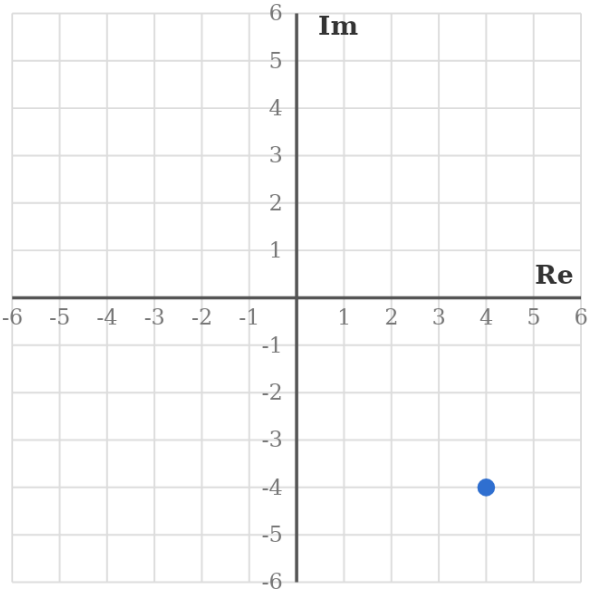
B



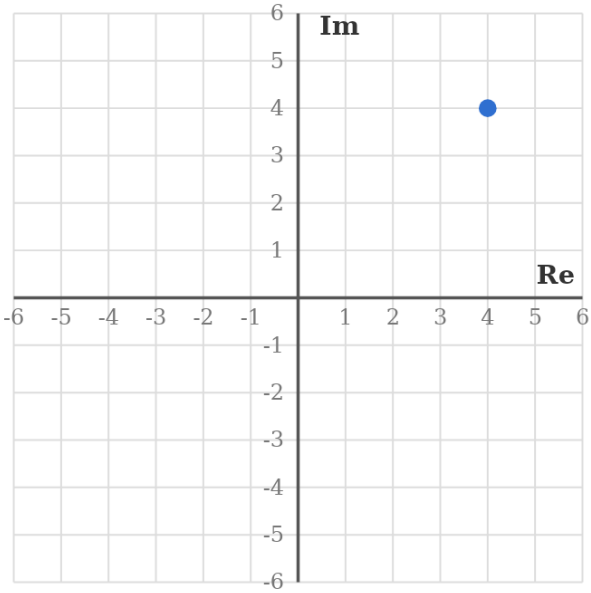
28 Which graph plots this complex number?

$$4-4i$$

A



B



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Complex Numbers - Geometric Representation

29 What is the product z times its conjugate?

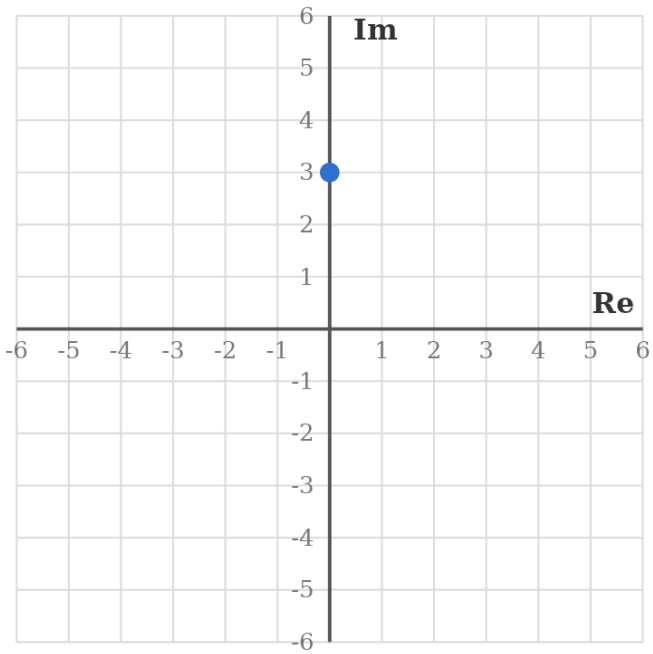
$$(-3+4i)(\overline{-3+4i})$$

A -7	B -6
C $9+16i$	D 25

30 The product z times its conjugate equals which of these?

A $\lvert z\rvert+1$	B $2\lvert z\rvert$
C $\lvert z\rvert^2$	D $\lvert z\rvert$

31 Which complex number is plotted?



A $-3i$

B 3

C $3i$

32 Add these complex numbers.

$$(-3-3i)+(2i)$$

A $-3-5i$

B $-3-i$

C $-2-i$

33 Subtract the second complex number from the first.

$$(-2+3i)-(-3+2i)$$

A	$-5+5i$
B	$1+5i$
C	$2+i$
D	$1+i$

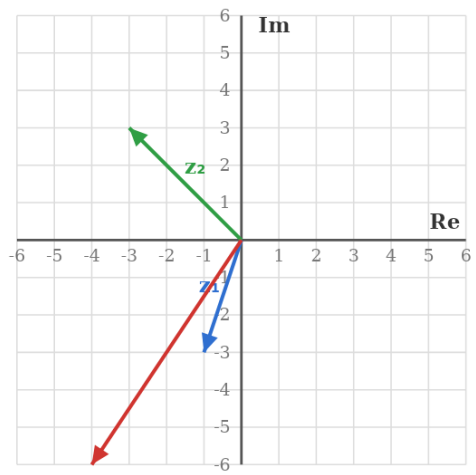
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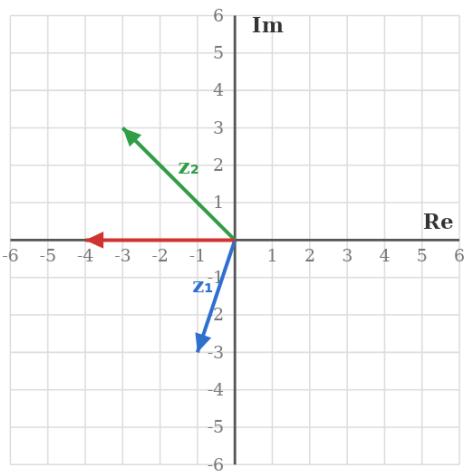
34 Which component diagram represents $z_1 + z_2$ for $z_1 = -1 - 3i$ and $z_2 = -3 + 3i$?

$z_1 = -1 - 3i$ and $z_2 = -3 + 3i$.

A



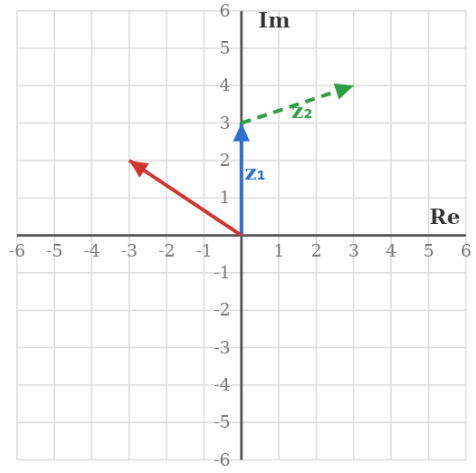
B



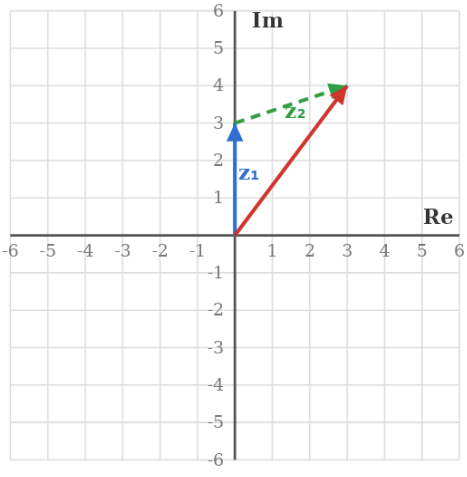
35 Which head-to-tail diagram represents $z_1 + z_2$ for $z_1 = 3i$ and $z_2 = 3 + i$?

$z_1 = 3i$ and $z_2 = 3 + i$.

A



B



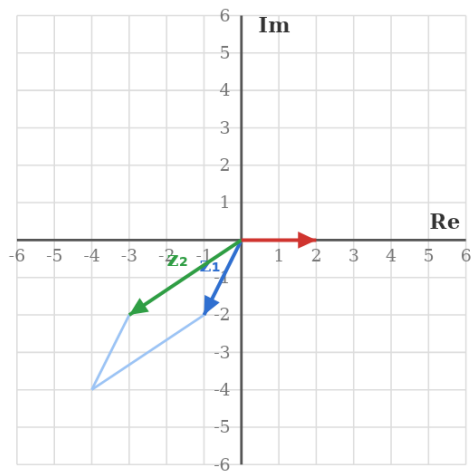
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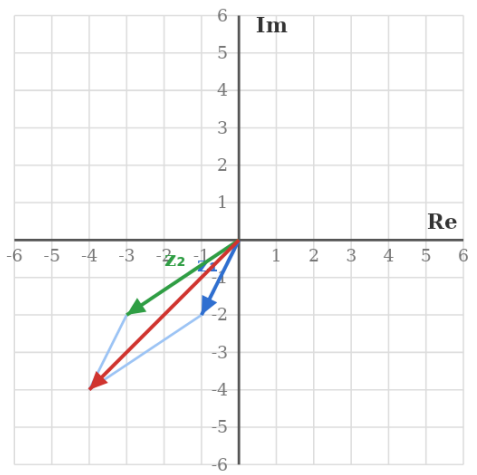
36 Which parallelogram diagram represents $z_1 + z_2$ for $z_1 = -1 - 2i$ and $z_2 = -3 - 2i$?

$z_1 = -1 - 2i$ and $z_2 = -3 - 2i$.

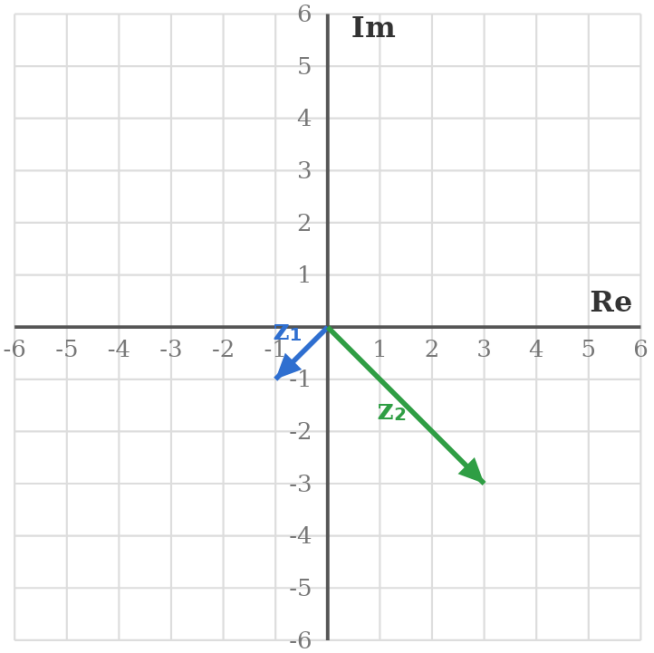
A



B



37 The two vectors show z_1 and z_2. What is $z_1 + z_2$?



A

$-4+2i$

B

$2+2i$

C

$2-4i$

D

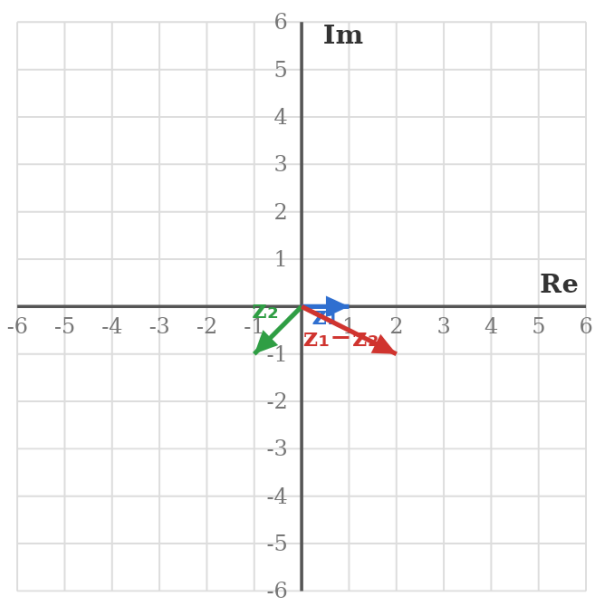
$-3+3i$

Name

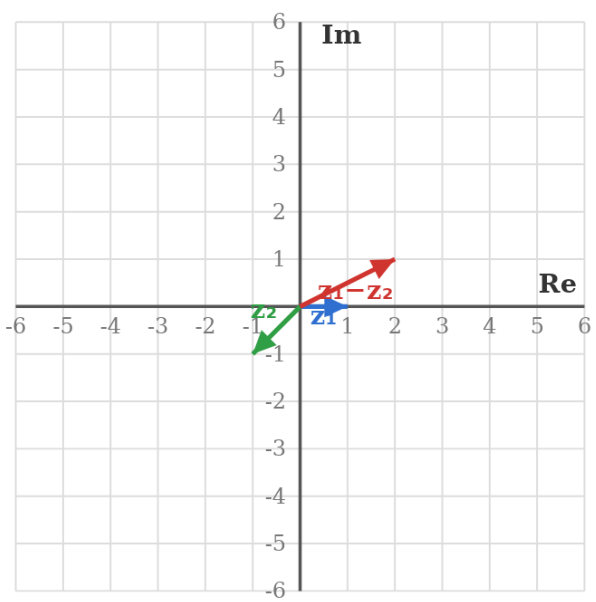
Complex Numbers - Geometric Representation

38 Which diagram represents $z_1 - z_2$?

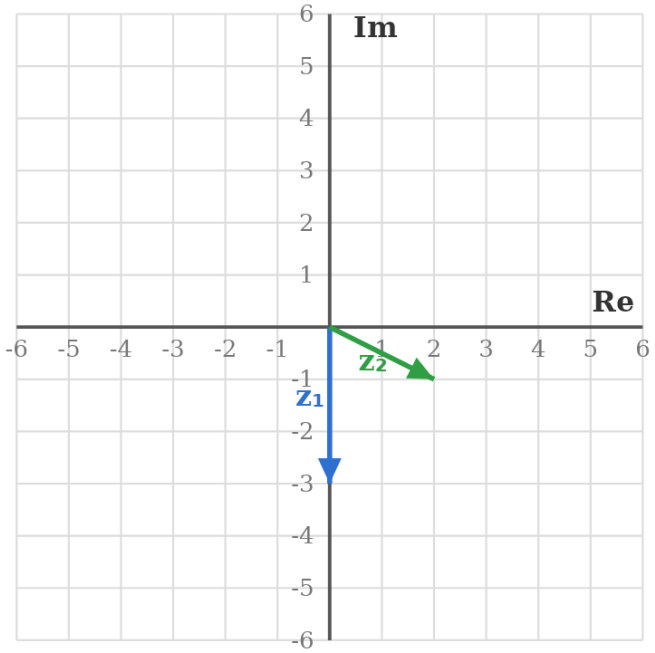
A



B



39 The vectors show z_1 and z_2. What is $z_1 - z_2$?



A

$$-2+2i$$

B

$$2+2i$$

C

$$-2-2i$$

D

$$2-4i$$

Name

Complex Numbers - Geometric Representation

40 Simplify the power of i

i^7

A -1	B $-i$
C 1	D i

41 To find the distance $|z_1 - z_2|$, first compute $z_1 - z_2$. What is it?

A	$2+3i$
B	$-2-3i$
C	$2-3i$
D	$-4-5i$

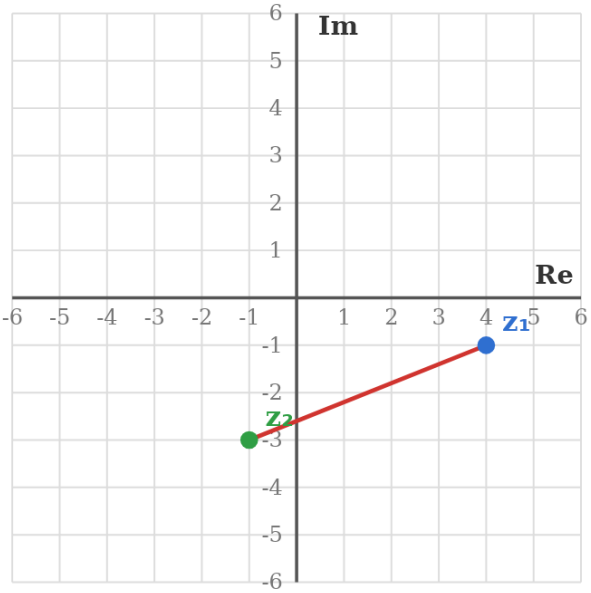
42 Simplify the power of i

i^{11}

A -1	B i
C $-i$	D 1

43 Which diagram shows the distance $|z_1 - z_2|$?

A



B

