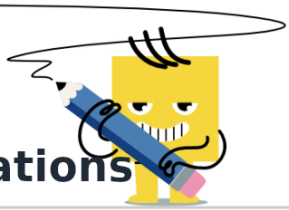
Name



Complex Numbers - Geometric Operations

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

$$-\frac{1}{10}$$

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

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

$$\frac{20}{4}$$

A	Natural Number
B	Irrational Number

3 Select the number that is a rational number

Rational Number

A $\sqrt{71}$	B $\sqrt{41}$
C $\frac{3}{4}$	

4 Select the number that is a pure imaginary number

Pure Imaginary Number

A $\frac{\sqrt{59}\,i}{6}$	B $-\frac{35}{7}$
C $\sqrt{\frac{80}{5}}$	

5 Select the description that matches a complex number

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

6 Select the description that matches a pure imaginary number

Pure Imaginary Number

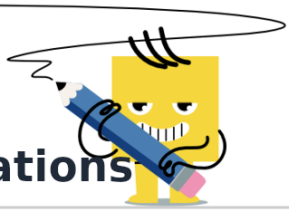
A	Any number that can be expressed as a fraction of two integers (e.g., 1/2, -3/4, 5).
B	A positive integer (1, 2, 3, ...).
C	A number that can be expressed as a real number multiplied by the imaginary unit i (e.g., -2.5i).
D	Any number that can be found on the number line, including both rational and irrational numbers.

7 Select the narrowest description that matches this number type

$$\frac{6}{11}$$

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

Name



Complex Numbers - Geometric Operations

8 Select the narrowest description that matches this number type

$$0.\overline{7}$$

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

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

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

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

9 Select the number type that matches this description

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

A Whole Number

B Irrational Number

10 Select the number type that matches this description

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

A Natural Number

B Whole Number

C Rational Number

D Irrational Number

11 Select the number that matches this description

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

A $\sqrt{41}$

B 9

C -14

12 Select the number that matches this description

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

A $\frac{\sqrt{71}\,i}{7}$

B $0.\overline{9}$

C $\frac{\sqrt{7}}{3}$

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

$$\text{Is } 7 \text{ a complex number}$$

A No

B Yes

14 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 No

B Yes

15 Is a pure imaginary number also a rational number?

A Sometimes

B Never

C Always

Name

Complex Numbers - Geometric Operations

16 Is a rational number also a complex number?

A: Never

B: Always

C: Sometimes

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

$$|5+5i|$$

A: $\sqrt{5^2+5^2}$

B: $\sqrt{5^2-5^2}$

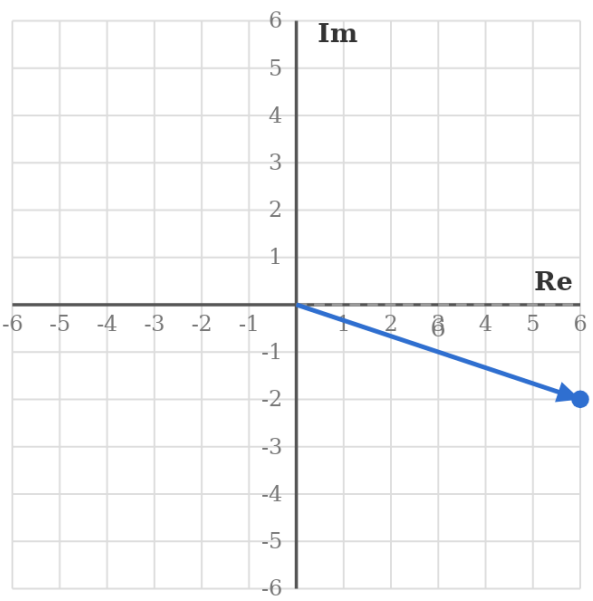
C: 5^2+5^2

D: $\sqrt{5+5}$

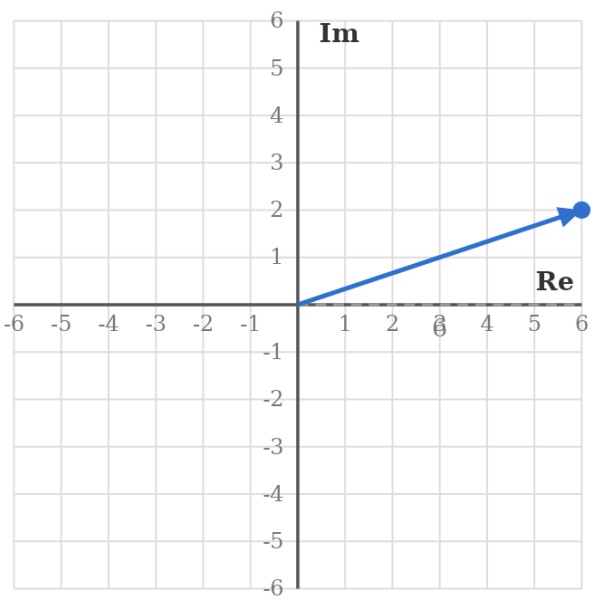
18 Which diagram correctly shows the modulus of this number as a distance from the origin?

$$6+2i$$

A



B



19 What is the modulus of this complex number?

$$|-4i|$$

A: $\sqrt{17}$

B: 4

20 A complex number z has |z| = 6 and lies on the real axis. What are the possible values of z?

A complex number z has modulus |z| = 6 and lies on the real axis.

A: $6i$ or $-6i$

B: 6

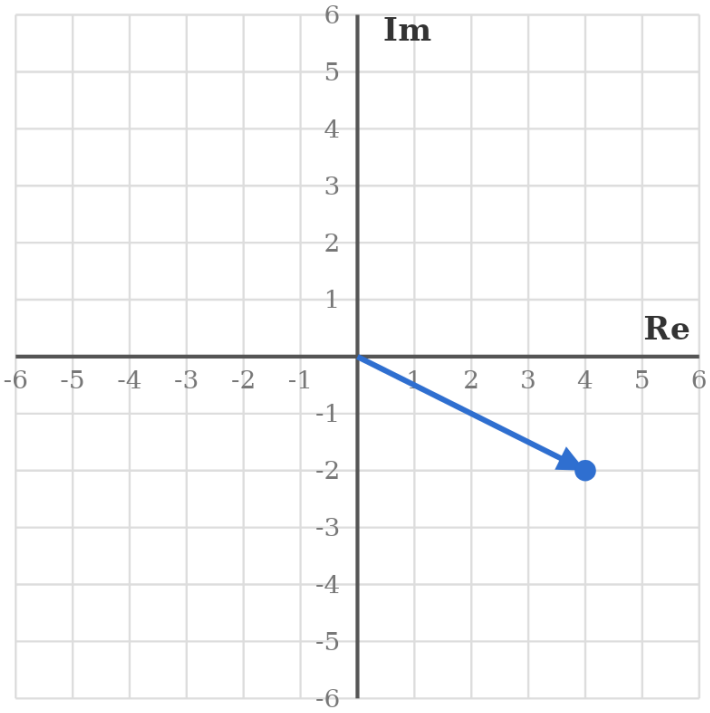
C: 6 or $6i$

D: 6 or -6

Name

Complex Numbers - Geometric Operations

21 What is the modulus of the plotted complex number?



A 6

B $2\sqrt{3}$

C $2\sqrt{5}$

D $2\sqrt{6}$

22 What is the complex conjugate of this number?

$\overline{-1-4i}$

A $-1+4i$

B $1-4i$

C $1+4i$

D $-1-4i$

23 What is the product z times its conjugate?

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

A 25

B -8

C $16+9i$

D 7

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

A $2|z|$

B $|z|$

C $|z|^2$

D $|z|+1$

25 Add these complex numbers.

$(-1-i)+(2i)$

A $-1+i$

B i

C $-1-3i$

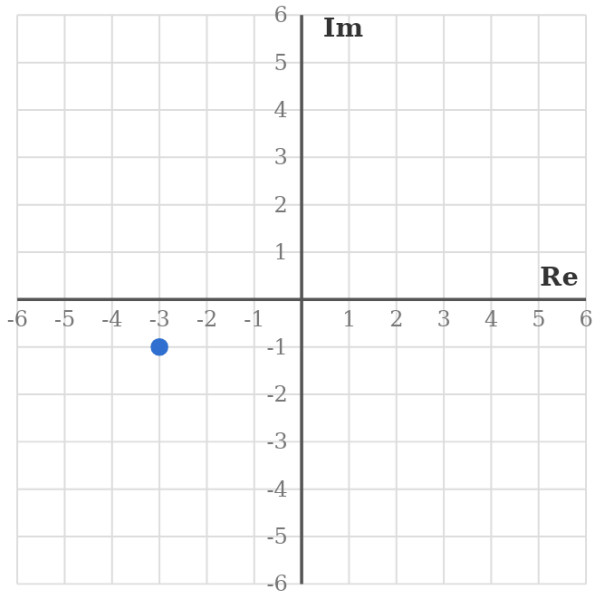
Name

Complex Numbers - Geometric Operations

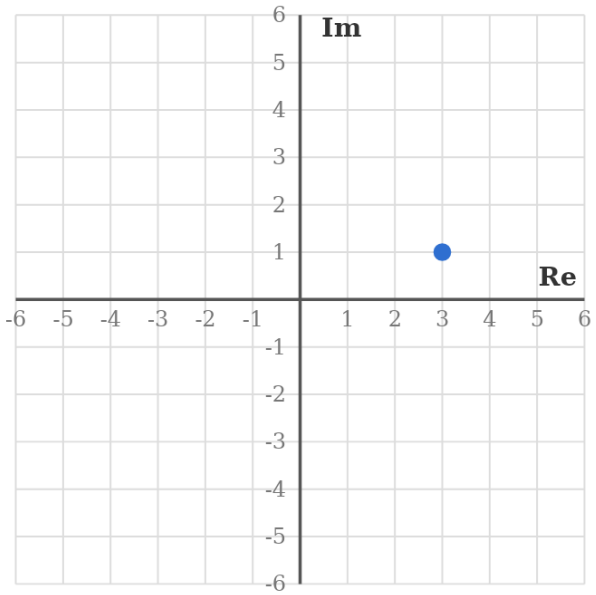
26 Which graph plots the conjugate of this number?

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

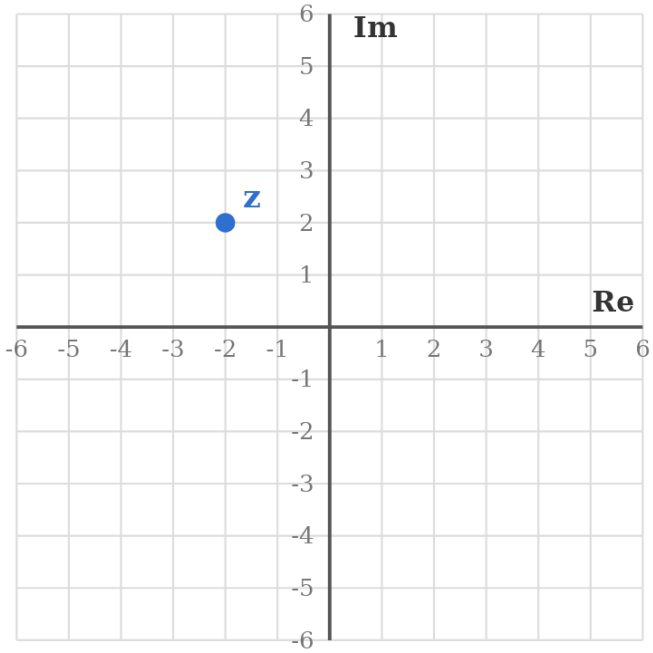
A



B



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



A

$2-2i$

B

$-2-2i$

C

$-2+2i$

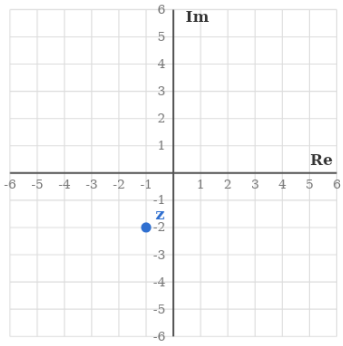
D

$2+2i$

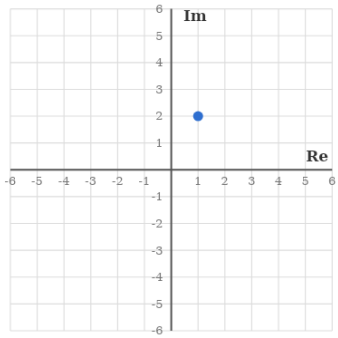
Name

Complex Numbers - Geometric Operations

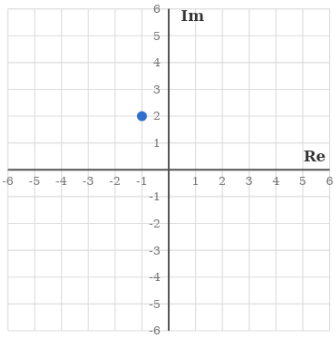
28 Which graph shows the conjugate of the plotted number z?



A



B



29 Subtract the second complex number from the first.

$$(-1+3i)-(-2-3i)$$

A 1	B $1+6i$
C -3	D $2+6i$

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

A	$1+i$
B	$-9+9i$
C	$1-i$
D	$-1-i$

31 What is the distance $|z_1 - z_2|$?

A 10	B $2\sqrt{5}$
C $\sqrt{34}$	D $2\sqrt{13}$

32 Multiply these complex numbers, using $i^2 = -1$.

$$(-1+4i)(-3-i)$$

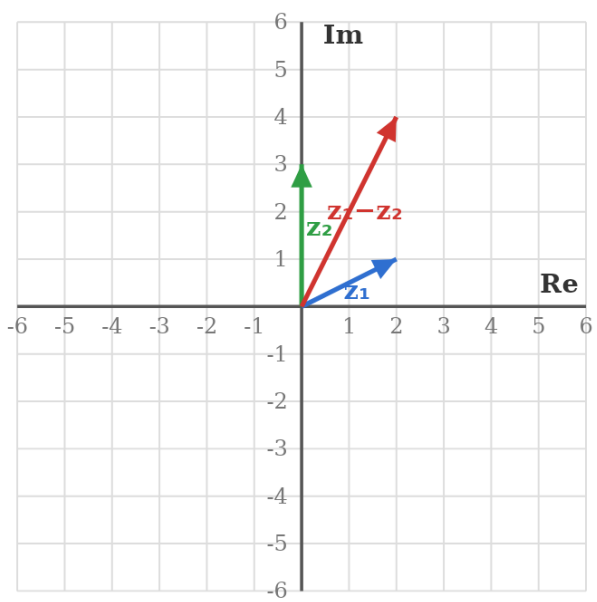
A	$7-11i$
B	$7+11i$
C	$-1-11i$
D	$3-4i$

Name

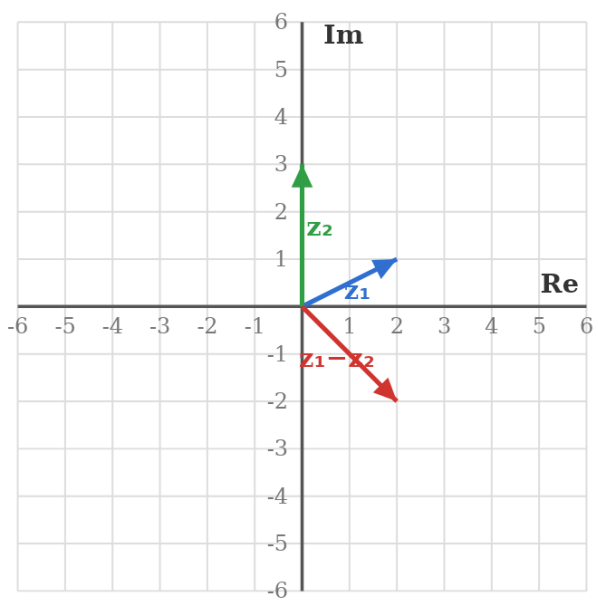
Complex Numbers - Geometric Operations

33 Which diagram represents $z_1 - z_2$?

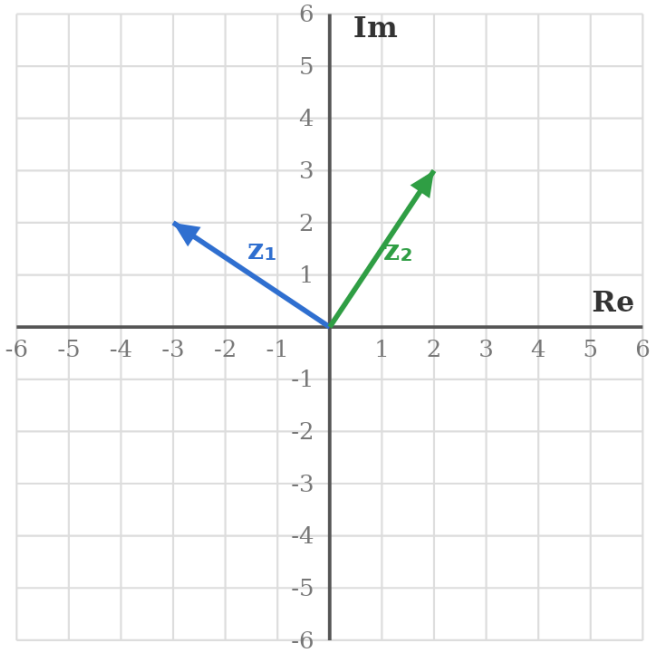
A



B



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



A $-5 - i$

B $-1 + 5i$

C $-5 + i$

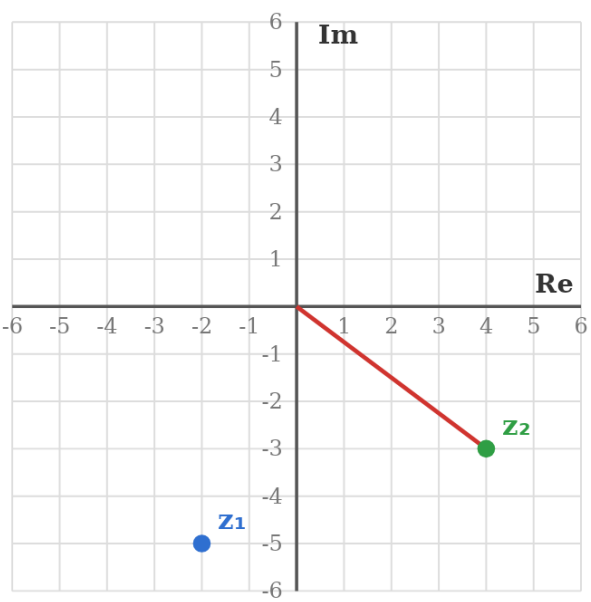
D $5 + i$

Name

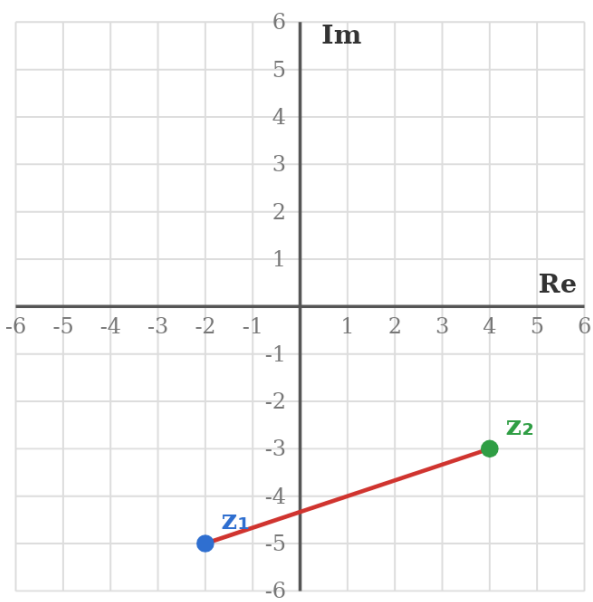
Complex Numbers - Geometric Operations

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

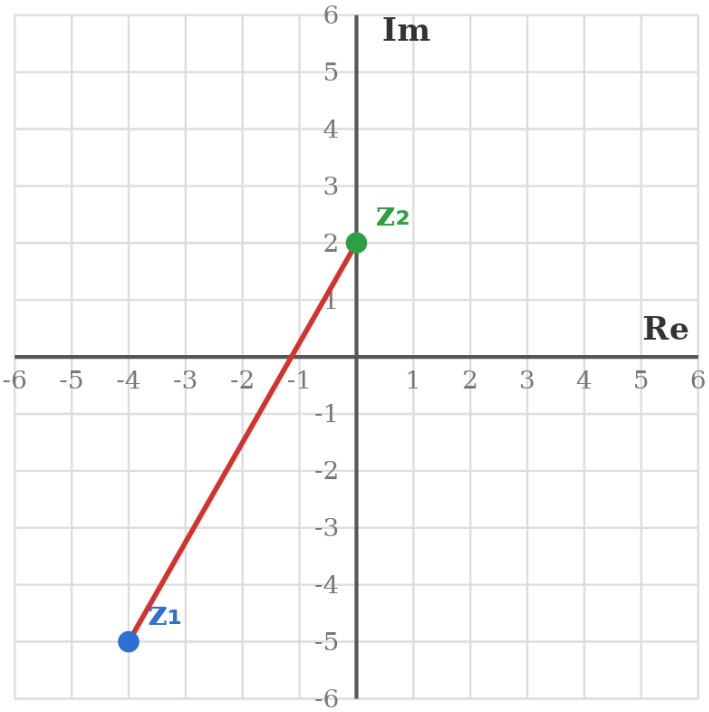
A



B



36 What is the distance between the two plotted complex numbers?



A $\sqrt{41}$

B 11

C $\sqrt{65}$

D $\sqrt{33}$

Name

Complex Numbers - Geometric Operations

37 Multiplying by this number scales by what factor (its modulus)?

$$-1-i$$

A $\sqrt{2}$	B 1
C 2	D $\sqrt{3}$

38 Multiplying by this number rotates by what angle (its argument)?

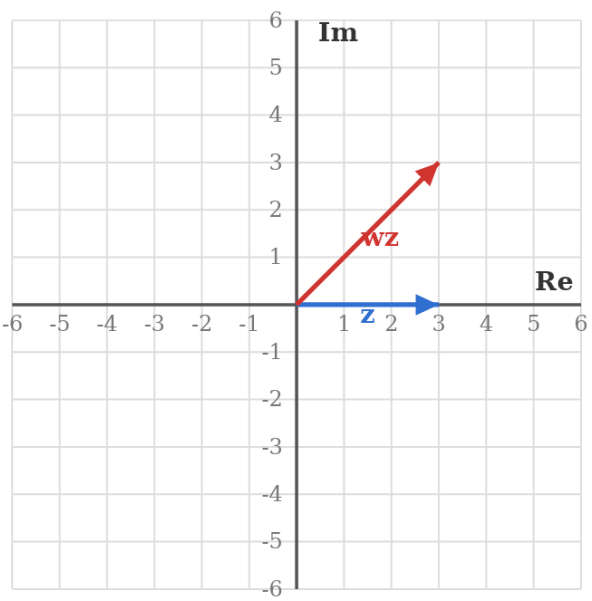
$$1-i$$

A $-45°$	B $-90°$
C $-135°$	D $45°$

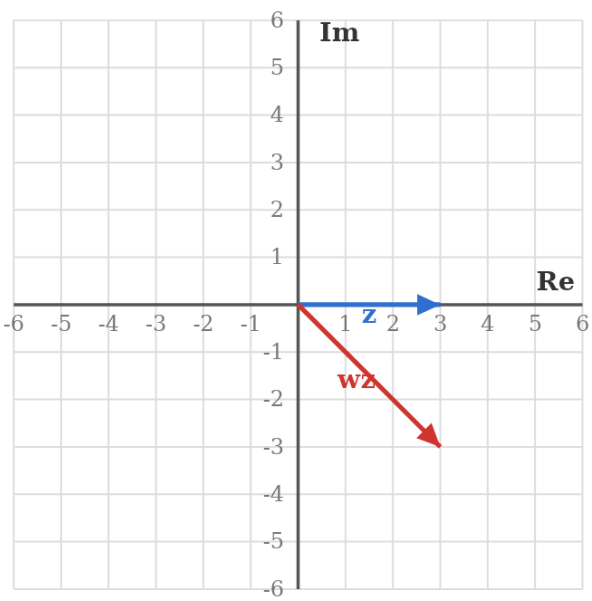
39 Which diagram shows the result of this multiplication?

$$(3)(1-i)$$

A



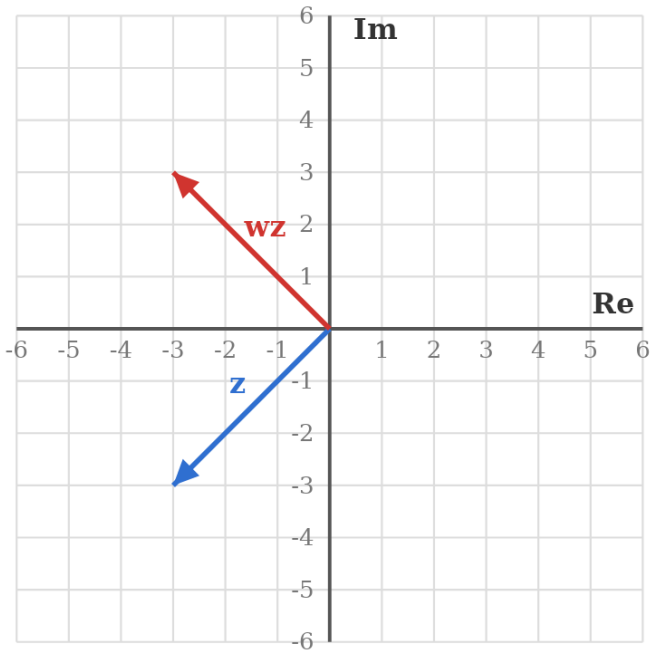
B



Name

Complex Numbers - Geometric Operations

40 The diagram shows z and wz. Which transformation maps z to wz?



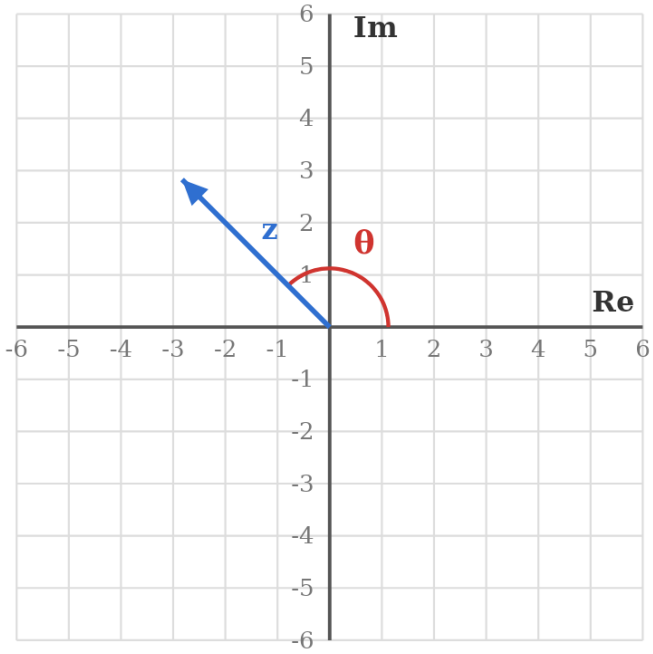
A
no scaling, rotate 90° clockwise

B
no scaling, rotate 90° counter-clockwise

C
scale by 2, rotate 90° clockwise

D
no scaling, no rotation

41 In which quadrant does the plotted complex number lie?



A
Quadrant IV

B
Quadrant II

C
Quadrant III

D
Quadrant I