46. For $i^2 = -1$, $(4 + i)^2 = ?$

F. 15
G. 17
H. $15 + 4i$
J. $15 + 8i$
K. $16 + 4i$

29. What is the product of the complex numbers $(-3i + 4)$ and $(3i + 4)$?

A. 1
B. 7
C. 25
D. $-7 + 24i$
E. $7 + 24i$

19. $\sqrt{x-5}$ is a real number if and only if:

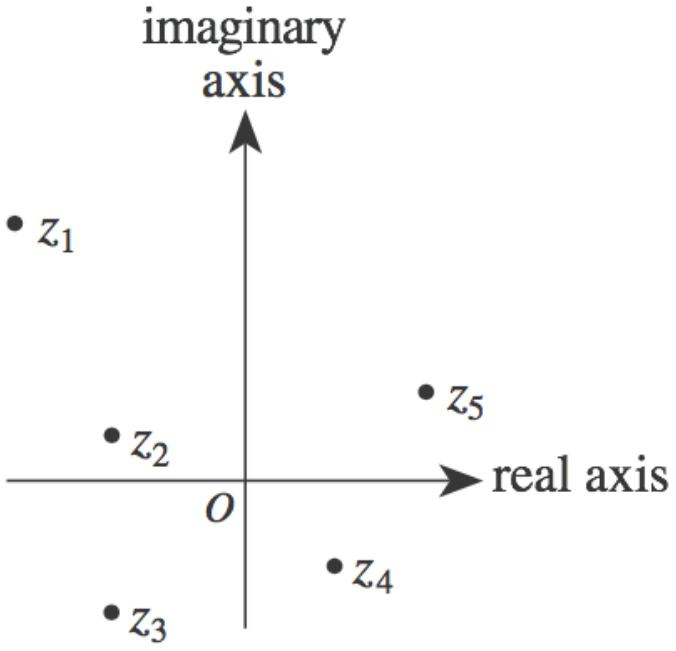
A. $x \leq -5$
B. $-5 < x < 0$
C. $x = 0$
D. $0 < x < 5$
E. $x \geq 5$

REAL VS. IMAGINARY NUMBERS

if $\sqrt{x<0}$, then Number is IMAGINARY

This is the ONLY ANSWER that WILL ALWAYS Produce RE

48. In the complex plane, the horizontal axis is called the *real axis* and the vertical axis is called the *imaginary axis*. The complex number $a + bi$ graphed in the complex plane is comparable to the point (a,b) graphed in the standard (x,y) coordinate plane. The *modulus* of the complex number $a + bi$ is given by $\sqrt{a^2 + b^2}$. Which of the complex numbers z_1, z_2, z_3, z_4, and z_5 below has the greatest modulus?



F. z_1
G. z_2
H. z_3
J. z_4
K. z_5

1. **What is the most simplified form of the expression below?**

$\sqrt{-49}$

- $-\sqrt{49}$
- 7
- $7i$
- $i\sqrt{49}$

2. **Simplify.**

$(-1 + 4i) - (-2 + i)$

- $-1 + 3i$
- $1 - 5i$
- $-1 - 5i$
- $1 + 3i$
- $1 + 5i$

3. **Simplify.**

$$\frac{6 + 2i}{3 - 3i}$$

- $\frac{2}{3} + \frac{4}{3}i$
- $\frac{2}{3} + \frac{2}{3}i$
- $\frac{4}{3} + \frac{4}{3}i$
- $\frac{2}{3} - \frac{2}{3}i$

4. **What is the complex conjugate of the expression below?**

$6 - 2i$

- $-6 + 2i$
- $-6 - 2i$
- $6 - 2i$
- $6 + 2i$

Which of the following is equal to $-16i^6$?

Possible Answers:

-16
-4
$16i$
16
4

Complex numbers take the form $a + bi$, where a is the real term in the complex number and bi is the nonreal (imaginary) term in the complex number.

Which of the following is equivalent to i^3 ?

Possible Answers:

i^{1000}

i^{30}

i^{23}

i^{82}

i

Simplify: $\frac{9+4i}{4i}$

Possible Answers:

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

$\frac{9}{4}+i$

$1+\frac{9}{4}i$

$1-\frac{9}{4}i$

$-\frac{9}{4}+i$

Evaluate: $100 \div 5i \div 5i$

Possible Answers:

4
$100i$
$-4i$
-100
-4

Evaluate: $100i \div (4i)^2$

Possible Answers:

$-\frac{25}{4}i$

$-\frac{25}{4}$

$-\frac{25}{2}$

$\frac{25}{4}i$

$\frac{25}{2}i$

Evaluate: $i \div (1+i)^2$

Possible Answers:

$\frac{1}{2}$

$-\frac{1}{2}i$

$\frac{1}{2}i$

2

$2i$

Simplify: $\frac{6+12i}{4}$

Possible Answers:

$6+3i$

None of these answers are correct

$\frac{3}{2}+\frac{12i}{4i}$

$\frac{3}{2}+3i$

$\frac{3}{2}+12i$

Simplify by using conjugates: $\dfrac{4+2i}{-3-2i}$

Possible Answers:

$\dfrac{-8-2i}{13}$

$\dfrac{-16+2i}{-13}$

$\dfrac{-8-2i}{5}$

$\dfrac{-16-2i}{13}$

$\dfrac{-16-2i}{5}$

Simplify:

$$\frac{5+7i}{2+i}$$

Possible Answers:

$1+3i$

$\frac{17}{5}+\frac{9}{5}i$

$\frac{5}{2}+\frac{7}{2}i$

$\frac{5}{7}+2i$

The solution of $\sqrt{x-3} > 2$ is the set of all real numbers x such that:

Possible Answers:

$x > 7$

$x > 3$

$x < 7$

$x > 1$

$x > 5$

Subtract a from b, given:

$a = 3 + i$

$b = 4 - 2i$

Possible Answers:

$1 + 3i$
$-1 - 3i$
$3 + i$
$1 - 3i$
$-1 + 3i$

Simplify the exponent,

$(3^6)^2$.

Possible Answers:

3^3
3^8
3^{12}
3^4

Complex numbers take the form $a + bi$, where a is the real term in the complex number and bi is the nonreal (imaginary) term in the complex number.

Simplify:

$(2 - 2i) - (4 - i)$

Possible Answers:

$6 - 3i$
None of these
$-2 - 3i$
$-2 - i$
$6 - i$

Which of the following equations simplifies into $4 + 2i$?

Possible Answers:

$0 + 6i + (-4 - 4i)$

$(0 + 7i) - (-4 - 5i)$

$(10 - i) - (6 - i)$

$(8 - 5i) + (-4 + 7i)$

$3 - (7 + 2i)$

What is the solution of the following equation?

$$3\,(8+5i)+\frac{1}{2}(4+2i)\,=?$$

Possible Answers:

$13+6i$

$24+i$

$12+7i$

$39+3i$

$26+16i$

What is the sum of a and b given

$a = 5 + 3i$

and

$b = 2 + i$**?**

Possible Answers:

11
$7 + 4i$
$3 + 2i$
$8i$
$5 + 6i$

Complex numbers take the form $a + bi$, where a is the real term in the complex number and *bi* is the nonreal (imaginary) term in the complex number.

Simplify: $(5 + 7i) + (17 - 4i)$

Possible Answers:

$-12 + 3i$

$22 - 3i$

$22 + 3i$

$-12 - 3i$

$22 + 11i$

Complex numbers take the form $a + bi$, where *a* is the real term in the complex number and *bi* is the nonreal (imaginary) term in the complex number.

Can you add the following two numbers: $3 + 7i$ and 8? If so, what is their sum?

Possible Answers:

Yes, $11 + 7i$

Yes, $11 + 15i$

Yes, $3 + 7i + 8$

No, the two numbers cannot be added because one is complex and one is not.

Yes, $3 + 15i$

What is the product of $7i - 3$ and $6 + 2i$

Possible Answers:

$-18 + 14i$

$-32 + 48i$

$-32 + 36i$

$-18 + 36i$

$-4 + 36i$

Simplify the following:

$(9i + 12)(3i - 4)$

Possible Answers:

-75
21
38
-64
-21

Complex numbers take the form $a + bi$, where a is the real term in the complex number and bi is the nonreal (imaginary) term in the complex number.

Distribute: $2(4 + 7i)$

Possible Answers:

$4 + 14i$

None of these are correct

$8 + 7i$

$6 + 7i$

$8 + 14i$

Complex numbers take the form $a + bi$, where a is the real term in the complex number and bi is the nonreal (imaginary) term in the complex number.

Distribute and solve: $5(3 + i) + 2(6 + 2i)$

Possible Answers:

$27 + 3i$
$27 + 9i$
$9 + 3i$
$9 + 9i$
None of these answers are correct

Complex numbers take the form $a + bi$, where a is the real term in the complex number and bi is the nonreal (imaginary) term in the complex number.

Simplify if possible. Leave no complex numbers in the denominator.

$$\frac{3 + 2i}{4 - 4i}$$

Possible Answers:

$\frac{3 + 3i}{4}$

The complex number cannot be simplified

$\frac{8 + 3i}{32}$

$\frac{-2 + 4i}{8}$

$\frac{1 + 5i}{8}$

Simplify the following:

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

Possible Answers:

25
14
7
37
33