

LESSON 4

GRAPHING COMPLEX NUMBERS

Every complex number can be expressed as a point in the complex plane as it is expressed in the form $a + bi$ where a and b are real numbers. a describes the real portion of the number and b describes the complex portion.

Graphing complex numbers is much similar to real graphing numbers. It is just a way to represent these numbers visually. Complex numbers consist of real and imaginary numbers. The real numbers include both rational and irrational integers, while the imaginary numbers are the square roots of negative numbers. We plot the real part of a complex number on the x-axis and the imaginary part on the y-axis. As a result, we label the x-axis as the real axis and the y-axis as the imaginary axis. A complex number of the form, $a + 0i$, lies on the x-axis. A complex number of the form $0 + bi$, lies on the y-axis. (see below).



How to represent a Complex Number in the coordinate plane.

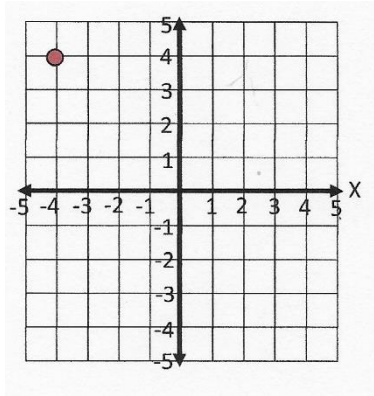
1. Determine the real part and the imaginary part of the complex number.
2. Move along the horizontal axis to show the real part of the number.
3. Move parallel to the vertical axis to show the imaginary part of the number.
4. Plot the point.

Example 1.

Graph the complex number, $-4 + 4i$

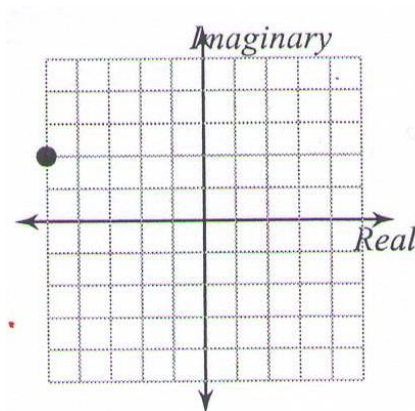
1. Determine the real part and the imaginary part of the complex number.
 -4 is the real part and $4i$ is the imaginary part.

Next, using steps 2 through 4 we plot the point as shown below.



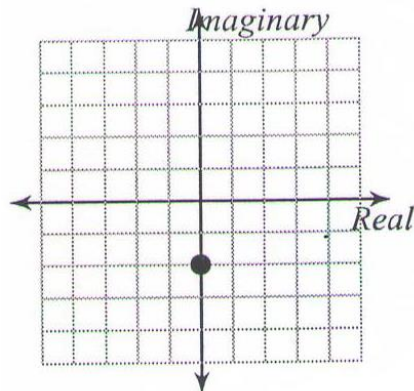
Example 2.

Graph the complex number, $-5 + 2i$



Example 3.

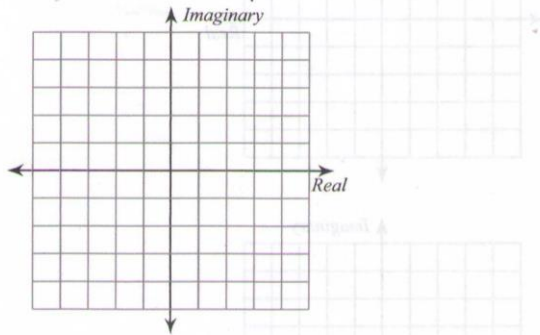
Graph the complex number, $-2i$



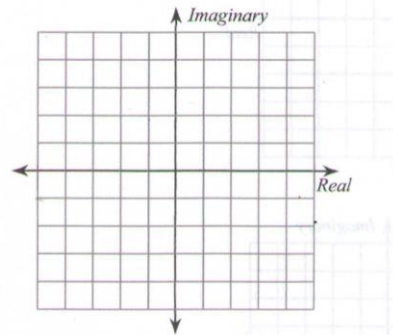
Lesson 4 Exercise

Graph each number in the complex plane.

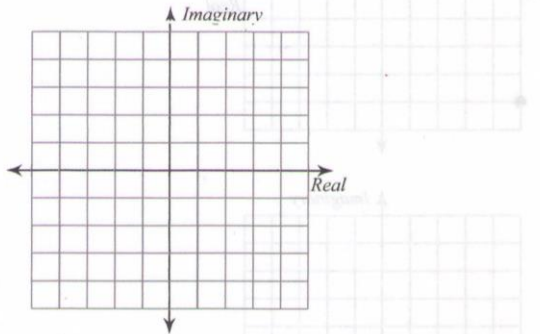
1) $-3i$



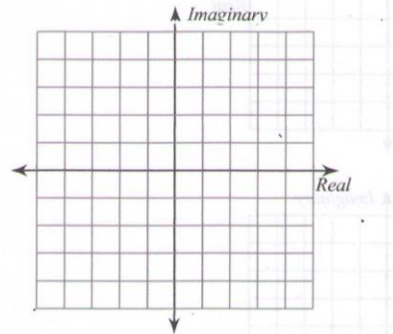
2) -2



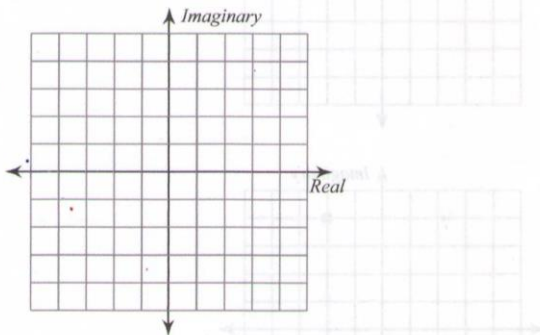
3) $-4 + 3i$



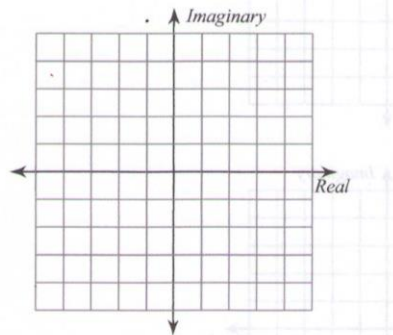
4) $-1 - 5i$



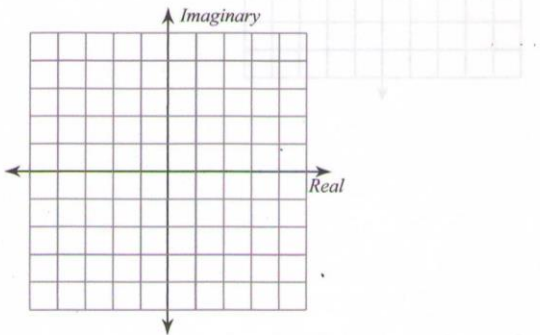
5) 5



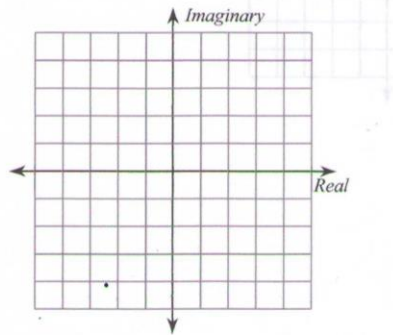
6) $2 + 4i$



7) $5 - 3i$

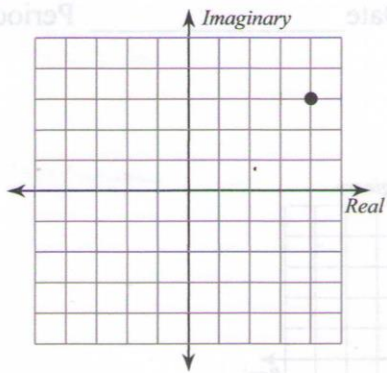


8) $-2 + i$

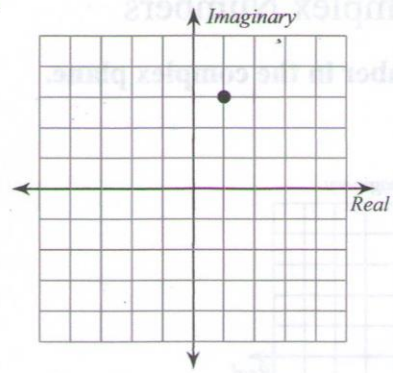


Identify each complex number graphed.

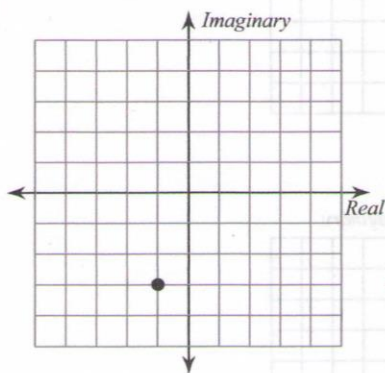
9)



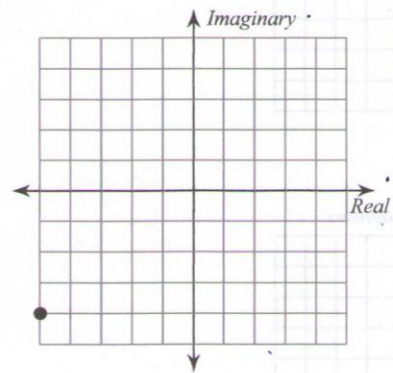
10)



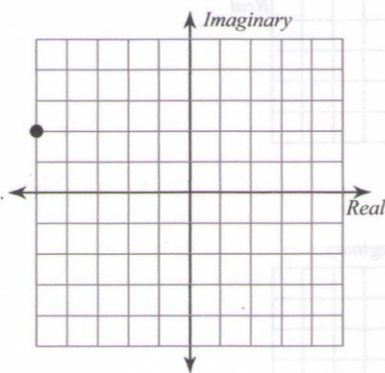
11)



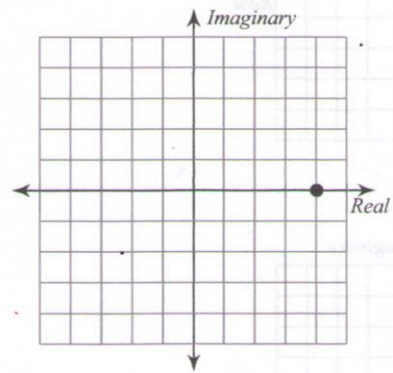
12)



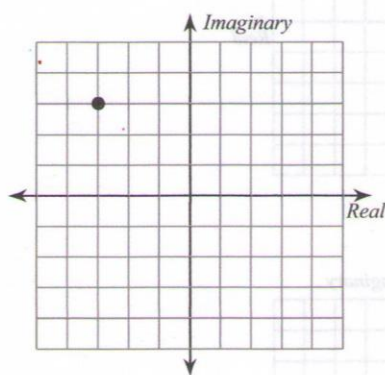
13)



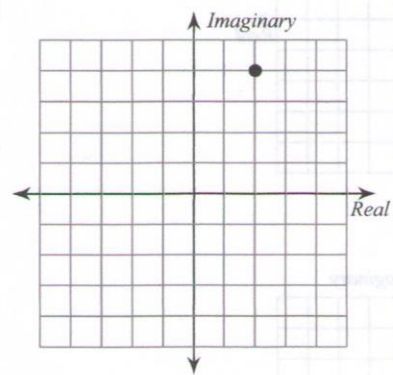
14)



15)



16)

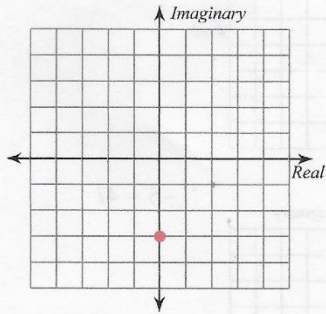


SOLUTIONS

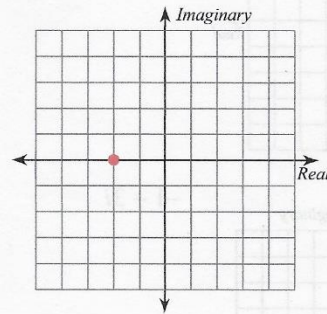
Lesson 4 Exercise

Graph each number in the complex plane.

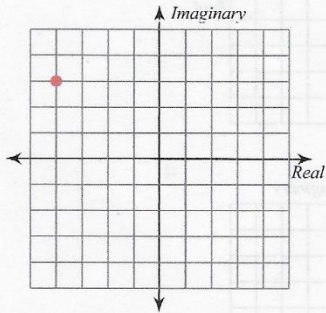
1) $-3i$



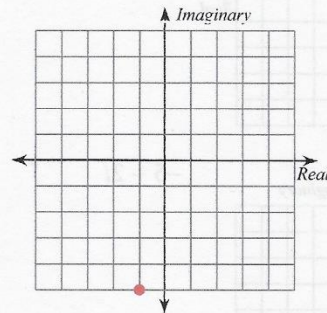
2) -2



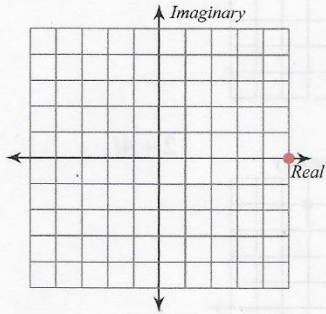
3) $-4 + 3i$



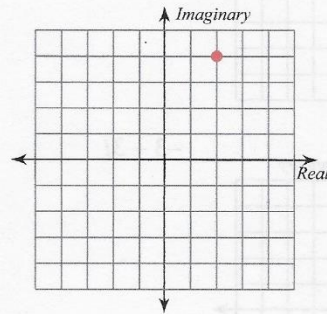
4) $-1 - 5i$



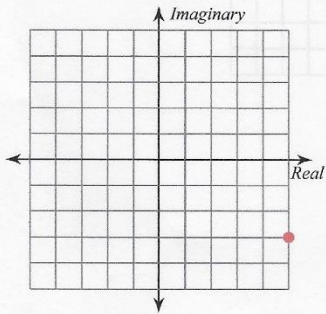
5) 5



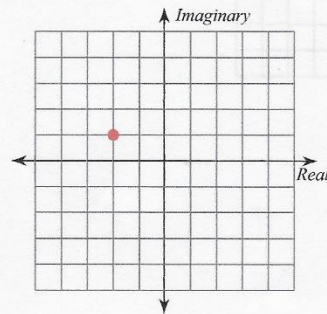
6) $2 + 4i$



7) $5 - 3i$

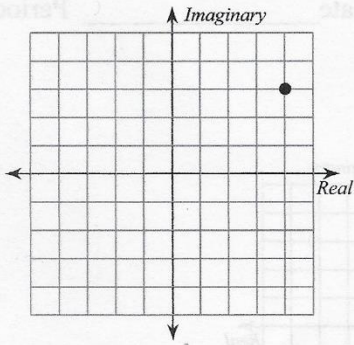


8) $-2 + i$

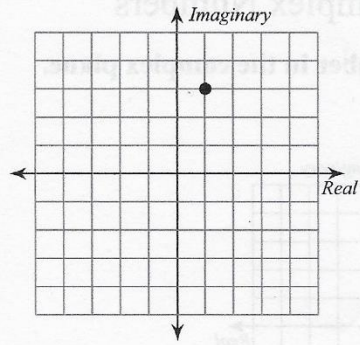


Identify each complex number graphed.

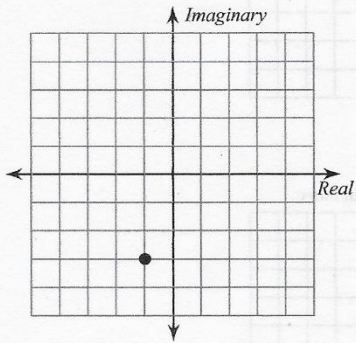
9) $4 + 3i$



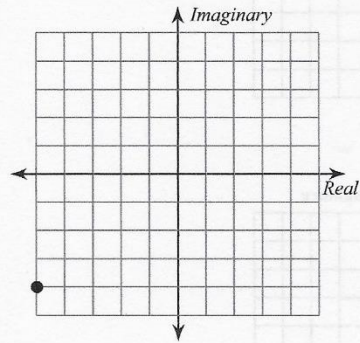
10) $1 + 3i$



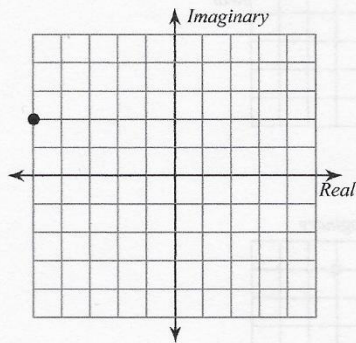
11) $-1 - 3i$



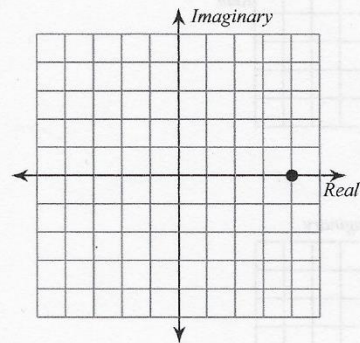
12) $-5 - 4i$



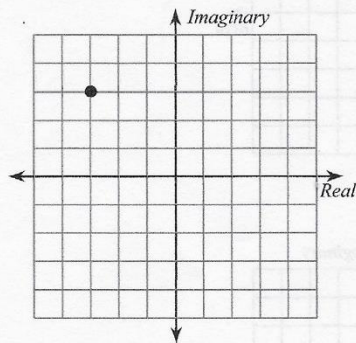
13) $-5 + 2i$



14) 4



15) $-3 + 3i$



16) $2 + 4i$

