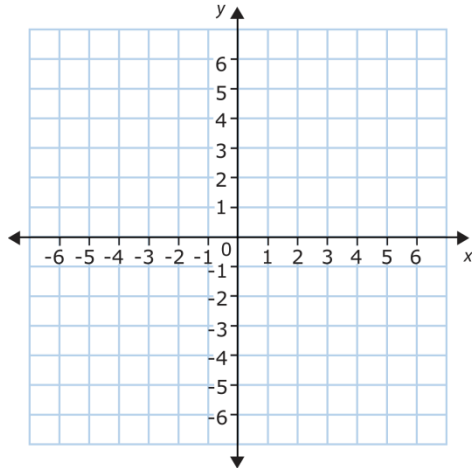


Practice Test
Complex Numbers

To receive full credit, all complex number answers must be written in the form $a + bi$, with $a, b \in \mathbb{R}$.

1. Identify each number indicated on the complex plane below.



A:

B:

C:

D:

E:

Find the absolute value of each complex number.

2. $|1 + 6i|$

3. $|27i|$

Perform the indicated operations.

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

5. $i(6 + 2i)$

6. $6 + (2 - 8i)$

7. $\frac{4-3i}{i}$

8. $(1 + i)(1 + 2i)$

9. $(3 - 5i) - (3 + 5i)$

10. $(4 - bi)(4 + bi)$

11. $\frac{3+i}{1+i}$

12. Suppose $f(x)$ is a quartic polynomial that has at least two complex roots: $-2i$ and $3 + 5i$. Will the graph of $f(x)$ cross the x -axis? Explain.

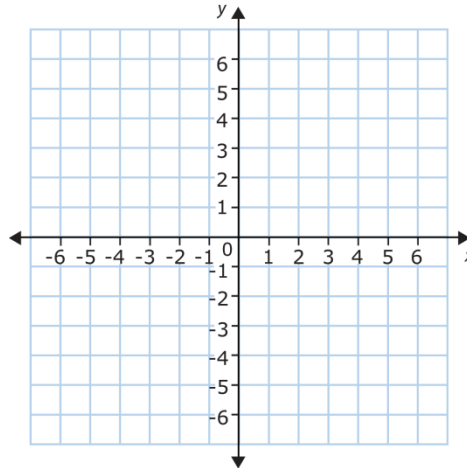
13. Graph and label the four points below on the complex plane.

A: $6 - 2i$

B: $4i$

C: $3 + 5i$

D: -2



Simplify each expression.

14. i^{18}

15. $-i^7$

16. $i^{8,000,001}$

17. $\sqrt{7i^{24} - 2i^2}$

18. Which of the following numbers is its own complex conjugate? Explain.

$3i$

7

$1 + i$

19. Is the following statement true or false? Explain or provide an example to show you are correct.

If $f(x)$ is a polynomial with real coefficients and $f(2) = 0$, then we must also have $f(-2) = 0$.

Find polynomials with real coefficients that have the following roots.

20. $x = 6i$

21. $x = 5 + i$

22. $x = 3$

23. $x = 1$ and $x = 2i$

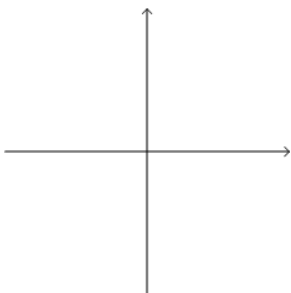
Find all roots, both real and complex, of the following functions.

24. $f(x) = x^3 + 2x^2 + 2x$

25. $f(x) = 2x^4 - 2$

Based on its description and graph, determine how many real and complex roots each function will have.

26. $f(x)$ is a quadratic function with the following graph.



27. $f(x)$ is a quartic function with the following graph.

