

## Calculations in the Complex Plane (ALG.CN.10)

Calculate the absolute value for each complex number.

1.  $|3 - 4i|$     **5**

2.  $|-7i|$     **7**

3.  $|8 + 3i|$      **$\sqrt{73}$**

4.  $|-9|$     **9**

5.  $|-15 + 8i|$     **17**

6.  $|\sqrt{6} - \sqrt{10}i|$     **4**

7.  $|5\sqrt{2} + 6i|$      **$\sqrt{86}$**

8.  $|(a - 1) - (a + 1)i|$      **$\sqrt{2a^2 + 2}$**

Calculate the distance between each pair of complex numbers.

9.  $2 + 7i$  and  $5 + 3i$     **5**

10.  $-9 - 6i$  and  $4 - 6i$     **13**

11.  $7 - 11i$  and  $-1 + 4i$     **17**

12.  $-5i$  and  $-4 + 3i$      **$4\sqrt{5}$**

13.  $\sqrt{10} + 2\sqrt{3}i$  and  $-\sqrt{10} - \sqrt{3}i$      **$\sqrt{67}$**

14.  $\frac{1}{8} - \frac{2\sqrt{7}}{3}i$  and  $-\frac{1}{8} - \frac{\sqrt{7}}{3}i$      **$\frac{11}{12}$**

Calculate the midpoint of the line segment for which each pair of complex numbers are endpoints.

15.  $3 + 7i$  and  $-1 + 21i$      **$1 + 14i$**

16.  $5 - 9i$  and  $5 + 9i$     **5**

17.  $-8i$  and  $5 + 2i$      **$2.5 - 3i$**

18.  $-3\sqrt{2} + \sqrt{11}i$  and  $\sqrt{2} + 6\sqrt{11}i$   
 **$-\sqrt{2} + 3.5\sqrt{11}i$**

19.  $0.7 - 2.4i$  and  $-0.11 - 0.2i$   
 **$0.295 - 1.3i$**

20.  $\frac{3}{4} + \frac{8}{3}i$  and  $-\frac{5}{2} + \frac{11}{6}i$      **$-\frac{7}{8} + \frac{9}{4}i$**

Determine the midpoint of the line segment whose endpoints are the given point and its complex conjugate.

21.  $7 - 2i$     **7**

22.  $\sqrt{5}i$     **0**

23.  $3\sqrt{2} + 8i$      **$3\sqrt{2}$**

24.  $-\sqrt{10} - 7\sqrt{2}i$      **$-\sqrt{10}$**