Date Completed: _____
Mentor Initials: _____

Complex Numbers (Basic)

1. What is the sum of the complex numbers $3 - 3i$ and $3 + 3i$?

A. 0
B. 6
C. 18
D. $6i$
E. $18 - 6i$

2. What is the product of the complex numbers $3 - 3i$ and $3 + 3i$?

A. 0
B. 6
C. 18
D. $6i$
E. $18 - 6i$

$$(3 - 3i) - (3 + 3i) = a + bi$$

3. In the equation above, a and b are real numbers and $i = \sqrt{-1}$. What is the value of b?

A. -6
B. $-6i$
C. 0
D. 6
E. $6i$

4. In the complex number plane, where $i^2 = -1$, what complex number x is a solution to the equation $x(4 + 2i) = 10$?

A. -5
B. $-2 + i$
C. $1 - 4i$
D. $2 - i$
E. 5

5. In the complex number plane, where $i = \sqrt{-1}$, $\frac{1-i}{-5+i} =$

A. $-\frac{3}{13}+\frac{2}{13}i$

B. $-\frac{2}{13}+\frac{3}{13}i$

C. $\frac{2}{13}-\frac{3}{13}i$

D. $\frac{3}{13}-\frac{2}{13}i$

E. $\frac{3}{13}$

6. For $i^2 = -1$, $(i-4)^2 =$

A. -17
B. $-15+8i$
C. $15-8i$
D. 15
E. 16

7. Jaylen has been working on a quadratic equation problem and has found his answer to be $x = 8 \pm \sqrt{-16a^2}$. Which of the following gives Jaylen's answer in complex form?

A. $8 \pm ai$
B. $8 \pm 2ai$
C. $8 \pm 4ai$
D. $8 \pm 8ai$
E. $8 \pm 16ai$

8. Which of the following expressions is equal to $(3i+3)^2$? (Note: $i^2 = -1$)

A. 0
B. 9
C. 18
D. $9i$
E. $18i$

9. For all $x > 0$, which of the following expressions is equivalent to $\frac{i}{9-i}$?

A. $-\frac{1}{9}$

B. $\frac{1}{9}$

C. $\frac{1}{81} + \frac{1}{9}i$

D. $\frac{1}{82} + \frac{9}{82}i$

E. $-\frac{1}{82} + \frac{9}{82}i$

10. What is the distance, in coordinate units, between $6 - 2i$ and $-3 + 4i$ in the complex plane?

A. 5

B. 26

C. $\sqrt{73}$

D. $\sqrt{117}$

E. $\sqrt{137}$

11. The product of two complex numbers is 36. If one of the numbers is the complex number $4 + i$, what is the other number?

A. $24 - 3i$

B. $\frac{144}{17} - \frac{36}{17}i$

C. $9 + 36i$

D. $4 - i$

E. $\frac{1}{9} + \frac{1}{36}i$

$$i^2 + (-i)^2$$

12. In the complex number system, which of the following is equivalent to the expression above?

A. $-2i$

B. -2

C. 0

D. 2

E. $2i$

$$(11 - 3i)(7 - 6i) = c + di$$

13. In the equation above, c and d are real numbers and $i = \sqrt{-1}$. What is the value of c?

A. -87
B. 0
C. 18
D. 59
E. 77