Date Completed: _____
Mentor Initials: _____

A mentor can change everything.

ESM PREP

Complex Numbers

Multiple Choice (No Calculator)

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

A) 0
B) 6
C) 18
D) $6i$

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

A) 0
B) 6
C) 18
D) $6i$

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

A) 9
B) 18
C) $9i$
D) $18i$

4. Which of the following complex numbers is equivalent to $\frac{i}{9-i}$? (Note: $i = \sqrt{-1}$)

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

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

C) $\frac{1}{82} + \frac{9}{82}i$

D) $-\frac{1}{82} + \frac{9}{82}i$

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

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

A) $-2i$
B) -2
C) 0
D) 2

Grid-In (No Calculator)

6. $(3 + 3i) - (3 - 3i) = a + bi$

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

7. $\frac{10-10i}{-5i}$

If the following expression above is rewritten in the form $a + bi$, where a and b are real numbers, what is the value of a ? (Note: $i = \sqrt{-1}$)

8. In the complex number system, what is the value of the expression $20i^4 - 5i^2 + 2$?

9. $(11 - 3i)(7 - 6i) = c + di$

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

10. $i^4 + i^5 + i^6 + i^7$

The complex number expression above can be rewritten in the form $c + di$, where c and d are real numbers. What is the value of $|c| + |d|$?