

Name: _____ Date: _____

Per: _____ 5.1 HW

Write in simplest form. ****Show your checks from your Calculator!****

1. $i^2 = -1$

2. $i^3 = -i$

3. $i^4 = 1$

4. $i^{11} = -i$

$$\begin{array}{r} 2 \\ 4 \overline{) 11} \\ \underline{8} \\ 3 \end{array}$$

$i^3 = -i$

5. $i^{41} = i$

$$\begin{array}{r} 10 \\ 4 \overline{) 41} \\ \underline{40} \\ 1 \end{array}$$

$i^1 = i$

6. $i^{30} = -1$

$$\begin{array}{r} 7 \\ 4 \overline{) 30} \\ \underline{28} \\ 2 \end{array}$$

$i^2 = -1$

7. $i^{25} = i$

$$\begin{array}{r} 6 \\ 4 \overline{) 25} \\ \underline{24} \\ 1 \end{array}$$

$i^1 = i$

8. $i^{36} = 1$

$$\begin{array}{r} 9 \\ 4 \overline{) 36} \\ \underline{36} \\ 0 \end{array}$$

$i^0 = 1$

9. $i^{51} = -i$

$$\begin{array}{r} 12 \\ 4 \overline{) 51} \\ \underline{48} \\ 3 \end{array}$$

$i^3 = -i$

10. $i^{45} = i$

$$\begin{array}{r} 11 \\ 4 \overline{) 45} \\ \underline{44} \\ 1 \end{array}$$

$i^1 = i$

11. $i^{80} = 1$

$$\begin{array}{r} 20 \\ 4 \overline{) 80} \\ \underline{80} \\ 0 \end{array}$$

$i^0 = 1$

12. $i^{70} = -1$

$$\begin{array}{r} 17 \\ 4 \overline{) 70} \\ \underline{68} \\ 2 \end{array}$$

$i^2 = -1$



Answer the following multiple choice questions. You must **SHOW YOUR WORK** for credit to be given. ****Check on Calculator.****

$$4 \sqrt[4]{\frac{7}{i^3}}$$

13. Which of the following is equivalent to $i^7 + i^8 + i^9 + i^{10}$?

- (1) 1
(2) $2+i$

- (3) $1-i$
(4) 0

$$-i + 1 + i + -1 = 0$$

14. When simplified, the sum $5i^{18} + 7i^{25} + 2i^{28} + 6i^{43}$ is equal to

- (1) $2-4i$
(2) $-3+i$

- (3) $5-7i$
(4) $8+i$

$$5(-1) + 7(i) + 2(1) + 6(-i) = -5 + 7i + 2 - 6i = -3 + i$$

$$4 \sqrt[4]{18} = \frac{16}{2} = 8$$

$$4 \sqrt[4]{25} = \frac{16}{4} = 4$$

$$4 \sqrt[4]{28} = \frac{16}{28} = \frac{4}{7}$$

$$4 \sqrt[4]{43} = \frac{16}{43}$$

15. Which of the following powers of i is *not* equal to 1?

- (1) i^{16}
(2) i^{26}

- (3) i^{32}
(4) i^{48}

Has a remainder

$$4 \sqrt[4]{16} = \frac{16}{16} = 1$$

Answer the following question. ****Check on Calculator.****

16. Simplify the following and write in $a + bi$ form: $3i^{12} + 5i^{21} - 2i^9$

$$3(+1) + 5(i) - 2(i)$$

$$3 + 3i$$

a

