Unit 3 Lesson 14: More Arithmetic with Complex Numbers

1 Which One Doesn't Belong: Complex Expressions (Warm up)

Student Task Statement

Which one doesn't belong?

A. i^2

B. $(1 + i) + (1 - i)$

C. $(1 + i)^2$

D. $(1 + i)(1 - i)$

2 Powers of i (Optional)

Student Task Statement

1. Write each power of i in the form $a + bi$, where a and b are real numbers. If a or b is zero, you can ignore that part of the number. For example, $0 + 3i$ can simply be expressed as $3i$.

   i^0

   i^1

   i^2

   i^3

   i^4

   i^5

   i^6

   i^7

   i^8

2. What is i^{100}? Explain your reasoning.

3. What is i^{38}? Explain your reasoning.

3 Add 'Em Up (or Subtract or Multiply) (Optional)

Student Task Statement

For each row, your partner and you will each rewrite an expression so it has the form $a + bi$, where a and b are real numbers. You and your partner should get the same answer. If you disagree, work to reach agreement.

partner A	partner B
$(7 + 9i) + (3 - 4i)$	$5i(1 - 2i)$
$2i(3 + 4i)$	$(1 + 2i) - (9 - 4i)$
$(4 - 3i)(4 + 3i)$	$(5 + i) + (20 - i)$
$(2i)^4$	$(3 + i\sqrt{7})(3 - i\sqrt{7})$
$(1 + i\sqrt{5}) - (-7 - i\sqrt{5})$	$(-2i)(-\sqrt{5} + 4i)$
$\left(\frac{1}{2}i\right)\left(\frac{1}{3}i\right)\left(\frac{3}{4}i\right)$	$\left(\frac{1}{2}i\right)^3$