## Unit 3 Lesson 12: Arithmetic with Complex Numbers

### 1 Math Talk: Telescoping Sums (Warm up)

#### Student Task Statement

Find the value of these expressions mentally.

$2−2+20−20+200−200$

$100−50+10−10+50−100$

$3+2+1+0−1−2−3$

$1+2+4+8+16+32−16−8−4−2−1$

### 2 Adding Complex Numbers

#### Student Task Statement

1. This diagram represents $\left(2+3i\right)+\left(-8−8i\right)$.
* 
	1. How do you see $2+3i$ represented?
	2. How do you see $-8−8i$ represented?
	3. What complex number does $A$ represent?
	4. Add “like terms” in the expression $\left(2+3i\right)+\left(-8−8i\right)$. What do you get?
1. Write these sums and differences in the form $a+bi$, where $a$ and $b$ are real numbers.
	1. $\left(-3+2i\right)+\left(4−5i\right)$ (Check your work by drawing a diagram.)
	2. $\left(-37−45i\right)+\left(11+81i\right)$
	3. $\left(-3+2i\right)−\left(4−5i\right)$
	4. $\left(-37−45i\right)−\left(11+81i\right)$

### 3 Multiplication on the Complex Plane

#### Student Task Statement

1. Draw points to represent 2, 22, 23, and 24 on the real number line.
* 
	1. Write $2i$, $\left(2i\right)^{2}$, $\left(2i\right)^{3}$, and $\left(2i\right)^{4}$ in the form $a+bi$.
	2. Plot $2i$, $\left(2i\right)^{2}$, $\left(2i\right)^{3}$, and $\left(2i\right)^{4}$ on the complex plane.
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