Adding Complex Numbers

Enter Exercises 1–5 on your calculator. Record the solution below and discuss with a partner how you think the calculator is adding the two complex numbers.

1. $(3 + 4i) + (2 + 5i) =$ _____

2. $(1 – 6i) + (3 – 2i) =$ _____

3. $(2 + 5i) + (6 – 8i) =$ _____

4. $(–2 + 3i) + (1 – 2i) =$ _____

5. $(4 – 3i) + (–5 – 7i) =$ _____

6. Explain how to add two complex numbers.

Subtracting Complex Numbers

Enter Exercises 1–5 on the calculator. Record the solutions below and discuss with a partner how you think the two complex numbers are being subtracted.

1. $(3 + 4i) – (2 + 5i) =$ _____

2. $(1 – 6i) – (3 – 2i) =$ _____

3. $(2 + 5i) – (6 – 8i) =$ _____

4. $(–2 + 3i) – (1 – 2i) =$ _____

5. $(4 – 3i) – (–5 – 7i) =$ _____

6. Explain how to subtract two complex numbers.

Multiplying Complex Numbers

Enter Exercises 1–2 on the calculator. Record the solutions below and discuss with a partner how you think the complex numbers are being multiplied.

1. $(3 + 4i)(2 + 5i) =$ _____

2. $(1 – 6i)(3 – 2i) =$ _____

3. Why is there no i^2 in the answers above?

Now, complete Exercises 4–6 using your calculator.

4. $(2 + 5i)(6 - 8i) =$ _____

5. $(-2 + 3i)(1 - 2i) =$ _____

6. $(4 - 3i)(-5 - 7i) =$ _____

7. Explain how to multiply two complex numbers.

Dividing Complex Numbers

Enter Exercises 1–2 on the calculator. Record the solutions below and discuss with a partner how you think two complex numbers are divided.

1. $\frac{(2+4i)}{3i} =$ _____

2. $\frac{(1-2i)}{2i} =$ _____

3. Notice the answers do not contain i in the denominator. What can you multiply an expression by to eliminate the imaginary part of the denominator? Try this for Exercises 1 and 2. (Hint: $i^2 = -1$.)

Now, complete Exercises 4–6 on calculator.

4. $\frac{(2-3i)}{4i} =$ _____

5. $\frac{(4-7i)}{-3i} =$ _____

6. $\frac{(8+5i)}{-2i} =$ _____

7. Repeat Question 3 for Exercises 4–6.

8. Explain how to divide a complex numbers by an imaginary number.

9. CHALLENGE: Find the rule to divide two complex numbers. How could you divide $\frac{(3+4i)}{(2-5i)}$? (Hint: Notice that $(2 - 5i)(2 + 5i) = 29$. Use this fact to help simplify the problem. $2 + 5i$ and $2 - 5i$ are called complex conjugates.)