

Vertical Progression:

7 th Grade	<p>7.EE.A Use properties of operations to generate equivalent expressions.</p> <ul style="list-style-type: none"> ○ 7.EE.A.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
Algebra 1	<p>ELG.MA.HS.A.3 Reason quantitatively and use units to solve problems.</p> <ul style="list-style-type: none"> ○ A-APR.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
Algebra 2	<p>ELG.MA.HS.N.4 Perform arithmetic operations with complex numbers.</p> <ul style="list-style-type: none"> ○ N-CN.1 Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real. ○ N-CN.2 Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
	<p>ELG.MA.HS.N.4 Perform arithmetic operations with complex numbers.</p> <ul style="list-style-type: none"> ○ N-CN.3 (+) Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.

Students will demonstrate command of the ELG by:

- Adding, subtracting, and multiplying complex numbers.
- Simplifying expressions involving complex numbers.

Vocabulary:

- complex numbers

Sample Instructional/Assessment Tasks:

1) Standard(s): **N-CN.2**

Source: <https://www.illustrativemathematics.org/content-standards/HSN/CN/A/tasks/617>

Item Prompt:

Rewrite each of the following expressions involving complex numbers in the form $a + bi$ where a and b are real numbers.

a.

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

b.

$$(5 + 4i)(17 - 13i) - (5 + 3i)(17 - 13i)$$

c.

$$\left(\frac{5}{2} + \frac{7i}{2}\right)^2 - \left(\frac{5}{2} + \frac{i}{2}\right)^2$$

d.

$$(1 + i)(13 - 4i)(1 - i)$$

e.

$$1 + i + i^2 + i^3$$

Correct Answer:

a. $16 - 11i$

b. $13 + 17i$

c. $-12 + 15i$

d. $26 - 8i$

e. 0