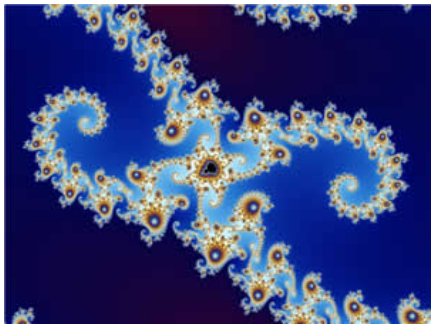
5.1 Complex Arithmetic

Practice Tasks



I. Concepts and Procedures

1. The _____ of a complex number is when you switch the sign of the complex part.

2. Evaluate the expression and write the result in the form $a + bi$.
   a. $(2 - 5i) + (3 + 4\,i)$

   b. $(-6 + 6i) + (9 - i)$

   c. $\left(7 - \frac{1}{2}i\right) - \left(5 + \frac{3}{2}i\right)$

   d. $-4(-1 + 2\,i)$

   e. $(3 - 4\,i)(5 - 12\,i)$

   f. $(8 - 2i^4) + (3 - 7i^8) - (4 + i^9)$

3. Find the complex conjugate of the following:
   a. $-5 + 3\,i$

   b. $4i$

   c. $1.23 + 2.73i$

2. Divide.

   a. $\frac{3}{3-i}$

   b. $\frac{1-2i}{2i}$

   c. $\frac{5-2i}{5+2i}$

   d. $\frac{\sqrt{3}-2i}{-2-\sqrt{3}i}$

3. Find the multiplicative inverse of each complex number.

   a. $2+3i$

   b. $-7-4i$

   c. $-4+5i$

II. Modeling

1. Find two imaginary numbers whose sum and product are real numbers. How are the imaginary numbers related?