

Complex Numbers /Quadratic Equations Activity

Math 1010

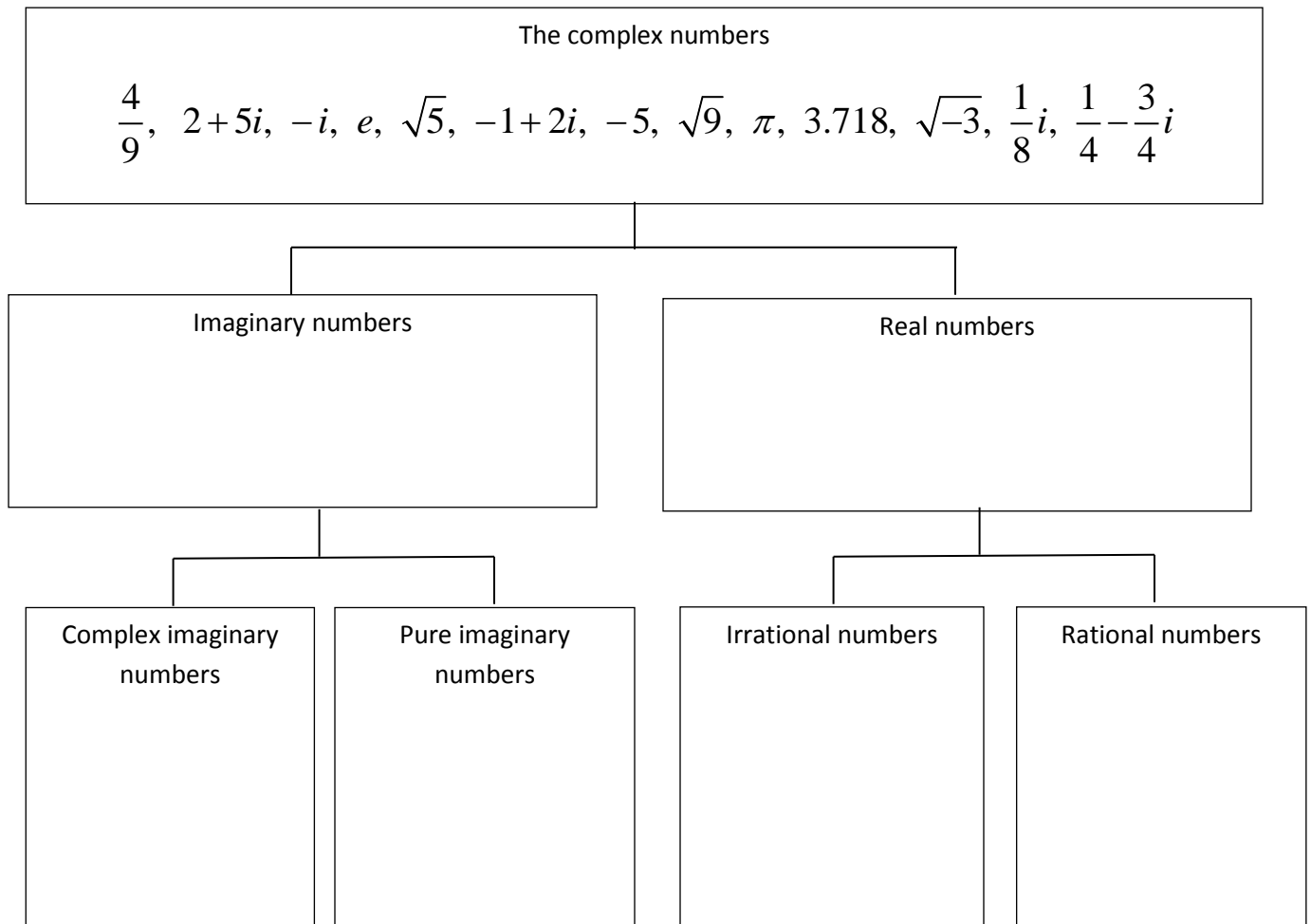
Complex numbers

Remember the two key connections: $x^2 = -1$ and $\sqrt{-1} = i$

Go to the following link and read about complex numbers.

<http://www.coolmath.com/algebra/10-complex-numbers/01-what-are-complex-numbers-01.htm>

Complete the chart below by listing each of the numbers given in the complex numbers box in the appropriate boxes below the complex numbers (either imaginary or real). Then take each of those numbers and put into the appropriate boxes on the bottom row. Work with another student and compare making sure you agree.



Powers of i

Find higher powers of i by breaking them down into factors which are known powers of i .
The first table is filled in for you.

i	i
i^2	-1
i^3	$i^2 \cdot i = -i$
i^4	$i^2 \cdot i^2 = (-1)(-1) = 1$

i^5	
i^6	
i^7	
i^8	

i^9	
i^{10}	
i^{11}	
i^{12}	

Do you see the pattern?

Watch the video: <http://www.youtube.com/watch?v=VTAsbx5wBal> and then fill out the following table:

i^{17}	
i^{64}	
i^{35}	
i^{64002}	

Completing the Square

Fill in the number you'd add to both sides of the equations to make the left hand side a perfect square trinomial and then factor the left side. You do **not** need to solve.

$x^2 + 14x + \underline{\quad} = 2 + \underline{\quad}$ $(\quad)^2 =$
$x^2 - 2x + \underline{\quad} = 2 + \underline{\quad}$ $(\quad)^2 =$

$x^2 + x + \underline{\quad} = 2 + \underline{\quad}$ $(\quad)^2 =$
$x^2 - 3x + \underline{\quad} = 2 + \underline{\quad}$ $(\quad)^2 =$

Discriminant Preparation

In Section 8.3 we will be looking at something called a discriminant. It is called this because it lets you “discriminate” (make a distinction between) types of solutions you will get for a quadratic equation. In preparation for this section, let’s look at the types of numbers you have for each of the following: (circle the correct number type)

$\sqrt{4}$	Rational	Irrational	Imaginary (complex)
$\sqrt{3}$	Rational	Irrational	Imaginary (complex)
$\sqrt{-25}$	Rational	Irrational	Imaginary (complex)
$\sqrt{50}$	Rational	Irrational	Imaginary (complex)
$-\sqrt{-16}$	Rational	Irrational	Imaginary (complex)
$-\sqrt{9}$	Rational	Irrational	Imaginary (complex)
$2 + \sqrt{36 - 4(5)}$	Rational	Irrational	Imaginary (complex)
$2 - \sqrt{36 - 4(3)}$	Rational	Irrational	Imaginary (complex)
$3 + \sqrt{4 - 4(2)}$	Rational	Irrational	Imaginary (complex)