

Subgroups of Complex Numbers

Identify the subgroup of Complex numbers a number belongs to.

[Link to section in textbook](#)

Now, watch [this video](#) to review the different sets of Complex numbers. First, try to define the following subgroups of the Complex Numbers. You should include examples for each (you may even want to take a sneak peak at the problems at the bottom of the page and use some of these as examples!) and descriptions of how to tell what the smallest set the number belongs to.

- Nonreal Complex:
- Pure Imaginary:
- Not a Complex Number:

The Real Numbers are just a part of the Complex Numbers, so we still have the subgroups from Objective 1. Now we will look at how all of these subgroups are related.

Question 1 *Like before, we will visualize the groups in a chart. An empty chart is provided below. Fill in the subgroups and try to classify the following numbers:*

$$-\frac{21}{7} + i, -\frac{7}{21}, \frac{21}{7}, \frac{\pi}{4}, \frac{4}{\pi}i, \frac{0}{\pi}, \frac{\pi}{0}i, -\sqrt{4}, \sqrt{-4}, \sqrt{21}, \sqrt{-21}$$

Learning outcomes: Understand the different sets of numbers along with the properties of these sets.

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Subgroups of Complex Numbers

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Smallest subgroup the number belongs to:

Natural: $\frac{21}{7}$

Whole: $\frac{0}{\pi}$

Integer: $-\sqrt{4}$

Rational: $-\frac{7}{21}$

Irrational: $\frac{\pi}{4}$, $\sqrt{21}$

Pure Imaginary: $\frac{4}{\pi}i$, $\sqrt{-4}$, $\sqrt{-21}$

Nonreal Complex: $-\frac{21}{7} + i$

Not a Complex Number: $\frac{\pi}{0}i$

Like Objective 1, remember to reduce first, then decide the smallest subgroup the number belongs to!

Note: This part of the homework will change each time you click “Another”. You can keep clicking “Another” to practice seeing these more difficult numbers to classify.

Question 2 Which of the following is the **smallest** set of Complex numbers that $\frac{-16}{8\pi} + 7i$ belongs to?

To work around current Xronos issues, input the corresponding number for the correct set.

Rational - 0

Irrational - 1

Nonreal Complex - 2

Pure Imaginary - 3

Not a Complex Number - 4

$\frac{2}{0}$

Question 3 Which of the following is the **smallest** set of Complex numbers

Subgroups of Complex Numbers

that $\frac{-14\pi}{0} + 11i$ belongs to?

To work around current Xronos issues, input the corresponding number for the correct set.

Rational - 0

Irrational - 1

Nonreal Complex - 2

Pure Imaginary - 3

Not a Complex Number - 4

4

Question 4 Which of the following is the **smallest** set of Complex numbers

that $\frac{-4}{9} + 16i^2$ belongs to?

To work around current Xronos issues, input the corresponding number for the correct set.

Rational - 0

Irrational - 1

Nonreal Complex - 2

Pure Imaginary - 3

Not a Complex Number - 4

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