Mathematics

Rational and irrational numbers

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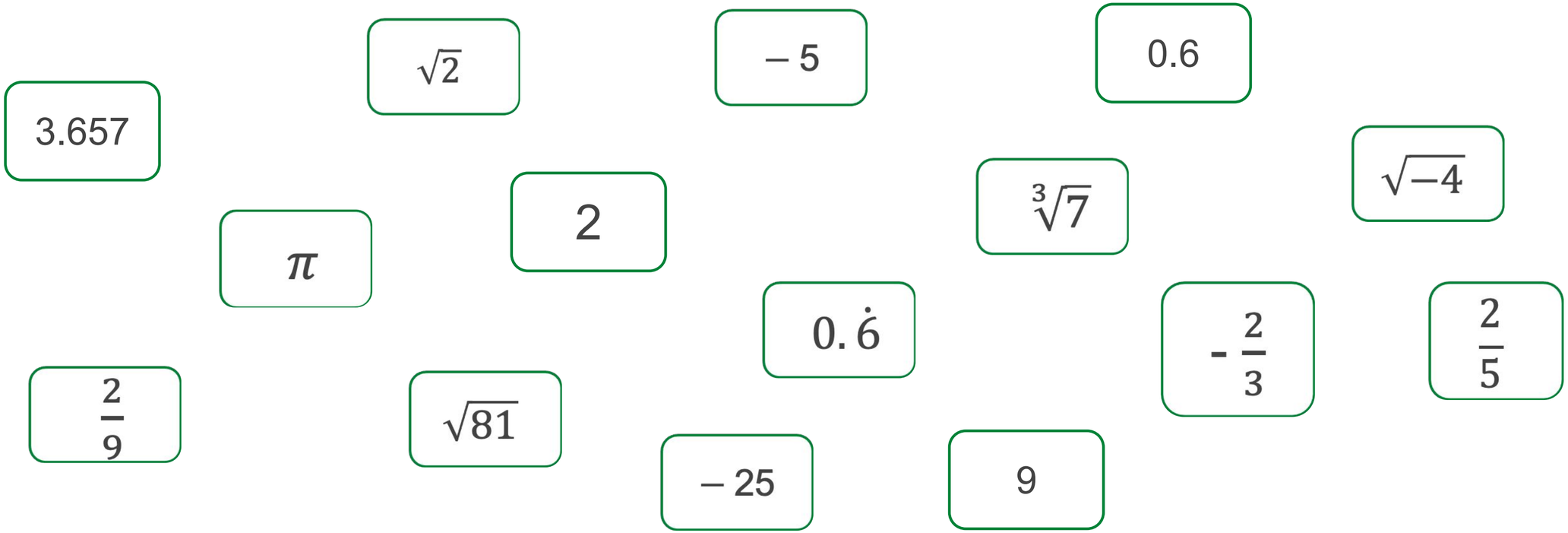
Try this

Categorise the numbers below into two groups.

Try categorizing a different way.



Try this - Support

Categorise the numbers below into two groups.

Try categorizing a different way.

3.657	$\sqrt{81}$	$\sqrt[3]{7}$	-5	-25	$\sqrt{-4}$
$\sqrt{2}$	2	0.6	$-\frac{2}{3}$		
π	$0.\dot{6}$	$\frac{2}{5}$			
$\frac{2}{9}$	9				

Independent task

1) Write down:

a. A rational number between 4 and 5.
b. A rational number that has a rational square root.
c. A rational number with an irrational square root.
d. An irrational number between 4 and 5.

2) Cara says: 0.111111111... is an irrational number because it goes on forever.
Is Cara right? Explain your answer.

3) John says “when you multiply two irrational numbers, the answer is always an irrational number”. Give an example to show that John is wrong.

Explore

Decide if each statement is true or false.

Justify your answer .

An irrational number is the same as a recurring decimal

All rational numbers can be written as a fraction

The square root of a non-square number are irrational

A repeating decimal pattern means the number is a rational number

There is an irrational number between any two rational numbers

Come up with your own statements that are true or false.

Solutions

Try this - Possible Solutions

Categorise the numbers below into two groups.

Try categorizing a different way.

2

9

-5

-25

$\frac{2}{5}$

$\frac{2}{9}$

$-\frac{2}{3}$

$\sqrt[3]{7}$

$\sqrt{-4}$

$\sqrt{2}$

0.6

3.657

$0.\dot{6}$

π

$\sqrt{81}$

Independent task - Solutions

1) Write down:

a. A rational number between 4 and 5. e.g. 4.5

b. A rational number that has a rational square root. e.g. 16, $\frac{1}{4}$

c. A rational number with an irrational square root. e.g. 5, 2, $\frac{1}{3}$

d. An irrational number between 4 and 5. $\sqrt{20}$

2) Cara says: 0.111111111... is an irrational number because it goes on forever.
Is Cara right? Explain your answer.

Cara is not right. All recurring decimals are rational numbers.
It is equivalent to $\frac{1}{9}$.

3) John says “when you multiply two irrational numbers, the answer is always an irrational number”. Give an example to show that John is wrong.

e.g. $\sqrt{2} \times \sqrt{2} = 2$ $\sqrt{2} \times \sqrt{8} = 4$

Explore - Solutions

Decide if each statement is true or false.

Justify your answer .

An irrational number is the same as a recurring decimal

False, recurring decimals are rational numbers.

All rational numbers can be written as a fraction

True, for example 5 can be written as $\frac{5}{1}$.

The square root of a non-square number are irrational

True, $\sqrt{8}$ is irrational.

A repeating decimal pattern means the number is a rational number

There is an irrational number between any two rational numbers

True, $\sqrt{8}$ is irrational.

True, $\sqrt{15}$ is is between 3 and 4 and it is irrational.

Come up with your own statements that are true or false.

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