



Junior Cert Maths

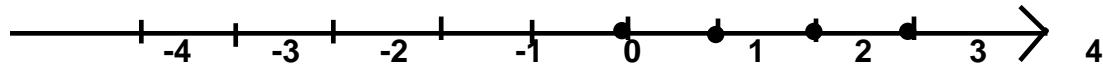
Free Notes

Number Line

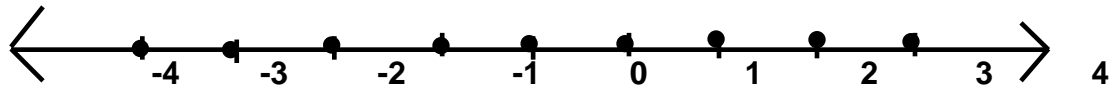


Number Line

N - The Natural numbers. This is the set of positive whole numbers i.e. 1,2,3,4,5.....etc



Z – The Integers. This is the set of negative and positive whole numbers which includes 0 i.e. ...-3,-2,-1,0,1,2,3...



R – The Real Numbers. This consists of all the numbers on the number line



Q – The set of rational numbers. This is any number that can be expressed as a fraction.



Numbers that are not rational are irrational and are denoted $\mathbb{R} \setminus \mathbb{Q}$. Irrationals cannot be expressed as fractions. Irrationals have an infinite amount of decimal places. A good example of this is π .

Since $\pi = 3.14159\dots$ etc it has an infinite amount of decimal places, it is irrational

Another good example is a root such as $\sqrt{7}$ or $\sqrt{13}$. They cannot be expressed as fractions and have an infinite amount of decimal places, therefore they are irrational.

Take x to be any number

If $x \in \mathbb{N}$ then x is a Natural number

If $x \in \mathbb{Z}$ then x is an Integer

If $x \in \mathbb{R} \setminus \mathbb{Q}$ then x is Irrational

If $x \in \mathbb{Q}$ then x is a Rational number

If $x \in \mathbb{R}$ then x is a Real number

4.1

Give two reasons why $-7 \cdot 3$ is not a natural number.

1. It's not positive
2. It's not a whole number

4.2

Why is 7.41 not an irrational number.

It can be expressed as a fraction $\frac{741}{1000}$ so it is a rational number.

Since it is rational it cannot be irrational

4.3

Under what sets of numbers does zero comes under?

0 is not a Natural number. The natural numbers start at 1 i.e 1,2,3,4,5...

0 is an Integer

0 is Rational as it can expressed as $\frac{0}{1}$

0 is Rational so it is not Irrational

0 is Real as it is on the number line

4.4

State which set of numbers (Natural numbers, Integers etc...) the following numbers come under $\sqrt{5}$, 8, 3.5, - 4 , π

$\sqrt{5}$ - Not Natural, Not an Integer, Not Rational, Real and Irrational $\in \mathbb{R}, \mathbb{R} \setminus \mathbb{Q}$
It is on the number line and it has an infinite amount of decimal places

8 – Natural, Integer, Rational, Real, Not Irrational $\in \mathbb{N}, \mathbb{Z}, \mathbb{Q}, \mathbb{R}$
Whole number that's positive and on the number line

3.5 – Not Natural, Not an Integer, Rational, Real and Not Irrational $\in \mathbb{Q}, \mathbb{R}$
Not a whole number, can be expressed as a fraction and is on the number line

-4 - Not Natural, Integer, Rational, Real and Not Irrational $\in \mathbb{Z}, \mathbb{Q}, \mathbb{R}$
Negative whole number, can be expressed as a fraction and is on the number line

π - Not Natural, Not an Integer, Not Rational, Real and Irrational $\in \mathbb{R}, \mathbb{R} \setminus \mathbb{Q}$

It is on the number line and it has an infinite amount of decimal places

4.5

State which set of numbers (Natural numbers, Integers etc...) the following numbers come under -8 , $\frac{1}{3}$, 6, $\sqrt{2}$, $\frac{\pi}{2}$

-8 - Not Natural, Integer, Rational, Real and Not Irrational $\in \mathbb{Z}, \mathbb{Q}, \mathbb{R}$
 Negative whole number, can be expressed as a fraction and is on the number line

$\frac{1}{3}$ - Not Natural, Not an Integer, Rational, Real and Not Irrational $\in \mathbb{Q}, \mathbb{R}$
 Not a whole number, can be expressed as a fraction and is on the number line

6 – Natural, Integer, Rational, Real, Not Irrational $\in \mathbb{N}, \mathbb{Z}, \mathbb{Q}, \mathbb{R}$
 Whole number that's positive and on the number line

$\sqrt{2}$ – Not Natural, Not an Integer, Not Rational, Real and Irrational $\in \mathbb{R}, \mathbb{R} \setminus \mathbb{Q}$
 It is on the number line and it has an infinite amount of decimal places

$\frac{\pi}{2}$ - Not Natural, Not an Integer, Not Rational, Real and Irrational $\in \mathbb{R}, \mathbb{R} \setminus \mathbb{Q}$
 It is on the number line and it has an infinite amount of decimal places

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