SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VQAR 1- QUANTITATIVE APTITUDE AND REASONING

II YEAR/ III SEMESTER

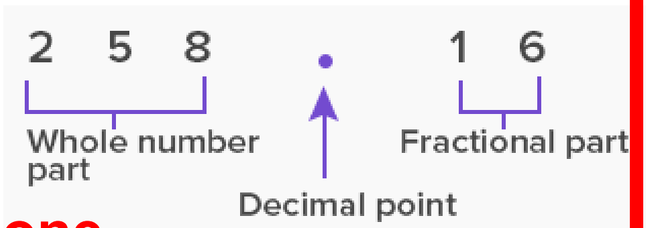
UNIT 1 – QUANTITATIVE ABILITY I

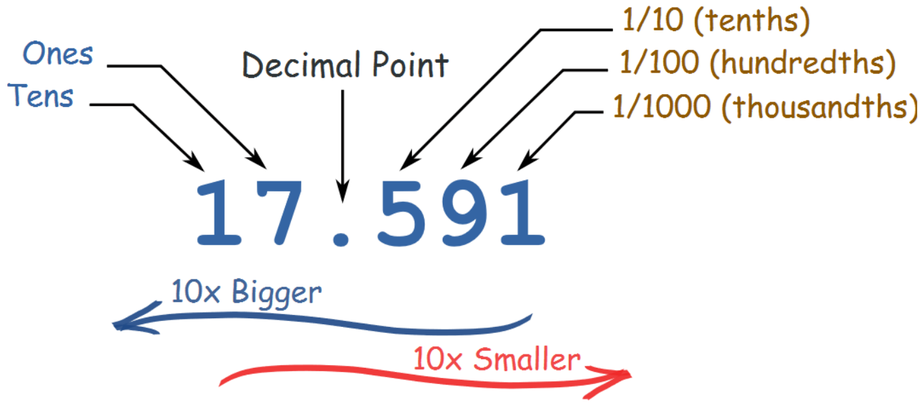
TOPIC 5 – DECIMAL & FRACTION

DECIMAL FRACTION

What is a Decimal?

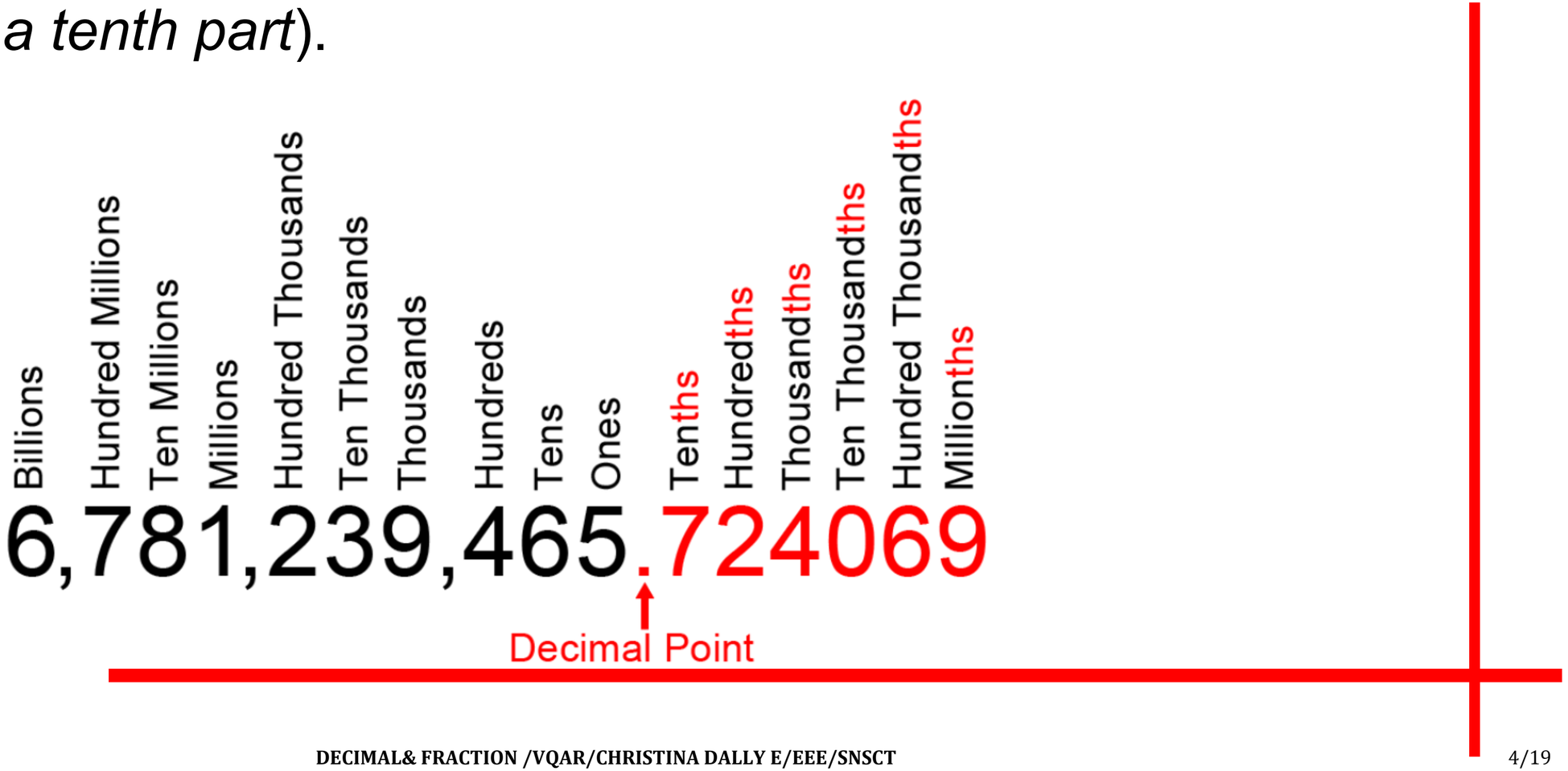
- In algebra, a decimal number can be defined as a number whose whole number part and the fractional part is separated by a decimal point.
- The dot in a decimal number is called a **decimal point**.
- The digits following the decimal point show a value smaller than **one**.



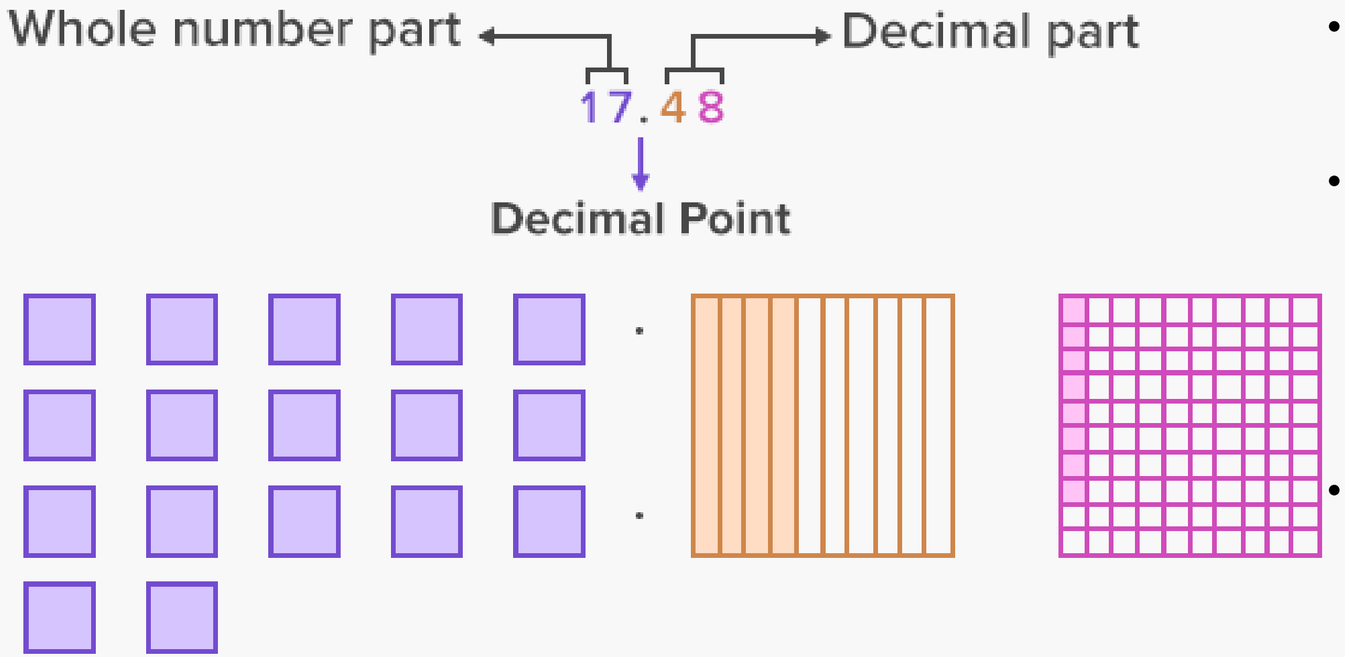


Word Decimal from,

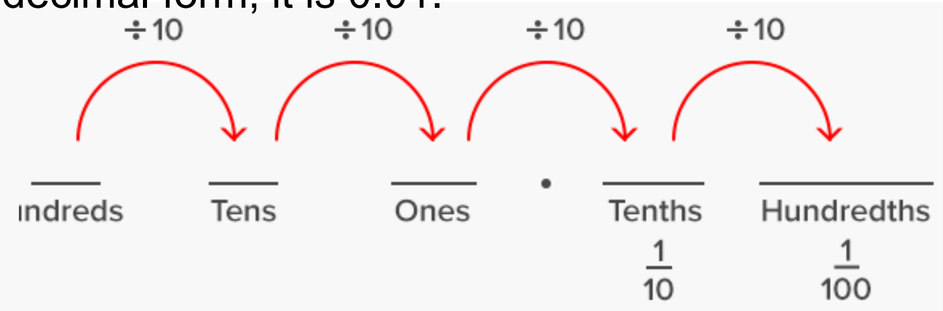
The word "Decimal" really means "based on 10" (From Latin *decima*: *a tenth part*).



Here's an example of a decimal number 17.48, in which 17 is the whole number, while 48 is the decimal part.

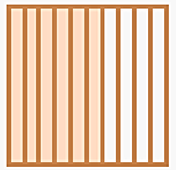


- Decimals are based on the preceding powers of 10.
- As we move from left to right, the place value of digits gets divided by 10, meaning the decimal place value determines the tenths, hundredths and thousandths.
- A tenth means one tenth or 1/10. In decimal form, it is 0.1. Hundredth means 1/100. In decimal form, it is 0.01.

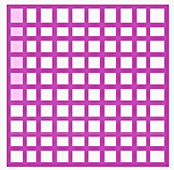


Here's an example of how the fractional part can be converted into decimals.

	Hundreds	Tens	Ones		Tenths	Hundredths	Thousandths
$25\frac{6}{10}$		2	5	•	6		
$25\frac{6}{100}$		2	5	•	0	6	
$25\frac{6}{1000}$		2	5	•	0	0	6



0.6 or $\frac{6}{10}$ or Six Tenths



0.06 or $\frac{6}{100}$ or Six Hundredths

0.006 or $\frac{6}{1000}$ or Six Thousandths

Decimals can be written both in expanded form and in words.

14.258

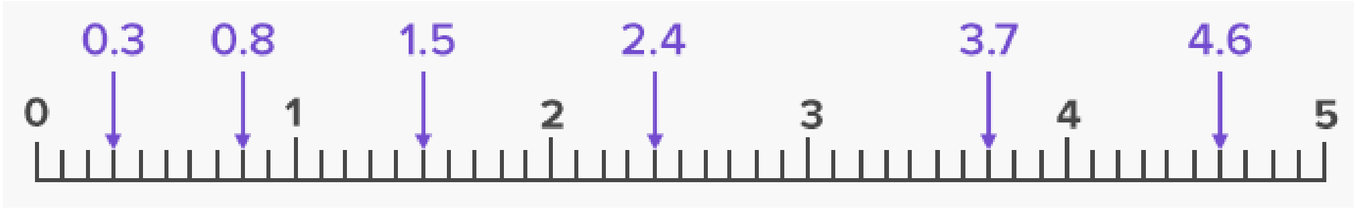
Expanded form : $10 + 4 + \frac{2}{10} + \frac{5}{100} + \frac{8}{1000}$

Decimal in words : Fourteen and two hundred fifty-eight thousandth

OR

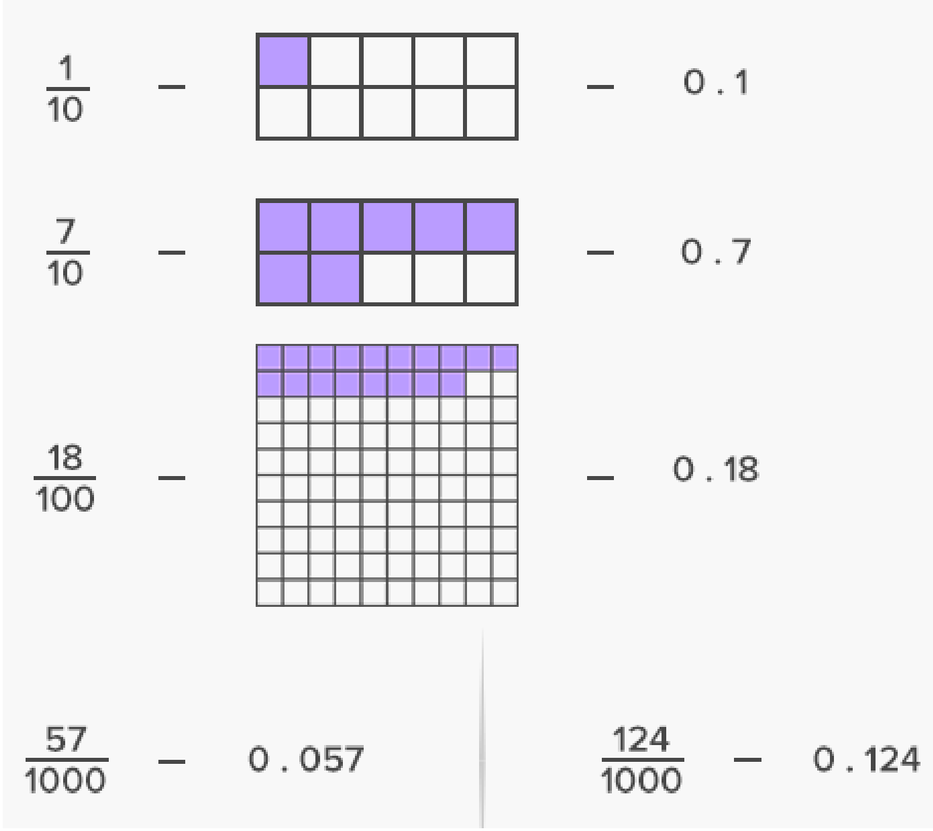
Fourteen point two five eight

- Tenths, hundredths, and thousandths can be represented on a number line.
- To represent tenths, the distance between each whole number on a number line is partitioned into 10 equal parts where each part represents a tenth.



What is a Decimal fraction?

- In algebra, a decimal fraction is a fraction whose denominator is 10 or a multiple of 10 like 100, 1,000, 10,000, etc.



Ways to think about Decimal Numbers …

… as a Whole Number Plus Tenths, Hundredths, etc

We can think of a decimal number as a whole number plus tenths, hundredths, etc:

Example 1: What is 2.3 ?

•On the left side is "2", that is the whole number part.

•The 3 is in the "tenths" position, meaning "3 tenths", or 3/10

•So, 2.3 is "2 and 3 tenths"

Example 2: What is 13.76 ?

•On the left side is "13", that is the whole number part.

•There are two digits on the right side, the 7 is in the "tenths" position, and the 6 is the "hundredths" position

•So, 13.76 is "13 and 7 tenths and 6 hundredths"

Cont.,

... as a Decimal Fraction

- A Decimal Fraction is a fraction where the denominator (the bottom number) is a number such as 10, 100, 1000, etc (in other words a power of ten)

So "2.3" looks like: $\frac{23}{10}$

And "13.76" looks like: $\frac{1376}{100}$

... as a Whole Number and Decimal Fraction

- Or we can think of a decimal number as a Whole Number plus a Decimal Fraction.

So "2.3" looks like: $2 \text{ and } \frac{3}{10}$

And "13.76" looks like: $13 \text{ and } \frac{76}{100}$

Converting a decimal number into a fraction....

- In the denominator part, place 1 under decimal point and suffix with as many zeroes as is the total number of digits after decimal point.
- Remove the decimal point and reduce the fraction to its lowest term.

.56 = 56/100 = 14/25

.0024 = 24/10000 = 3/1250

Suffixing zeroes to the right of a decimal fraction does not change its value. Thus 0.6 = 0.60 = 0.600 etc.

- If numerator and denominator contains same number of decimal places, we can remove decimal signs from each number.

2.71/3.41 = 271/341

14.4/15.6 = 144/156 = 12/13

Adding decimals

- Place each number under each other in such a way that decimal points lies in same column.

```
21.3 + .213 + 3.21 + .021 + 2.0031 = ?
21.3
  .213
 3.21
  .021
 2.0031
--------
26.7471
--------
```

Subtracting decimals

- Place each number under each other in such a way that decimal points lies in same column.

```
  23.004
-16.5628
---------
   6.4412
---------
```

Multiplying decimals

- Multiply given numbers without considering decimal point. In product, mark the decimal point as many places of decimals as is the sum of number of decimal places in the given numbers.

```
2.3 x 0.12 = ?
23 x 12 = 276
Sum of decimal places = 1 + 2 = 3
∴ 2.3 x 0.12 = 0.276
```

Dividing decimals by number

- Divide given decimal number without considering decimal point. In quotient, mark the decimal point as many places of decimals as is the sum of number of decimal places in the given dividend.

```
0.63 / 9 = ?
63 / 9 = 7
Decimal places in dividend = 2
∴ 0.63 / 9 = 0.07
```

Dividing decimals by decimals

- Multiply both dividend and divisor by such multiple of 10 so that divisor becomes a whole number.
- Divide dividend without considering decimal point.
- In quotient, mark the decimal point as many places of decimals as is the sum of number of decimal places in the given dividend.

```
0.00042/ 0.06 = ?
0.00042/ 0.06 = (0.00042 x 100 )/ (0.06 x 100)
= 0.042 / 6

Now 42/6 = 7
Decimal places in dividend = 3
∴ 0.00042 / 0.06 = 0.007
```

Recurring Decimals

- A decimal fraction in which all figures after decimal point are repeated is called a pure recurring decimals. For example,

  0.5555, 0.323232

Converting pure recurring decimal to fraction

- Put the repeating figure only once in the numerator and put as many nines in the denominator as in number of repeating figures.

```
Express 0.33333 in fraction.
0.3333 = 3/9 = 1/3

Express 0.2727 in fraction.
0.2727 = 27/99 = 3/11
```

DO YOU KNOW?

Decimal fractions were first developed and used by the Chinese in the end of 4th century BC, and then spread to the Middle East and from there to Europe.

Lets Strengthen Our Brain Muscles.,

Q 1 - Which is the following is fraction for 0.36?

A - 9/25

B - 51/25

C - 3/400

D - 2081/250

Answer - A

Explanation

```
0.36 = 36/100 = 9/25
```

Q 2 - Which is the following is fraction for 2.04?

A - 9/25

B - 51/25

C - 3/400

D - 2081/250

Answer - B

Explanation

```
2.04 = 204/100 = 51/25
```

Lets Strengthen Our Brain Muscles.,

Q 3 - Which is the following is fraction for .0075?

A - 9/25

B - 51/25

C - 3/400

D - 2081/250

Answer - C

Explanation

```
.0075 = 75/10000 = 3/400
```

Q 4 - Which is the following is fraction for 8.324?

A - 9/25

B - 51/25

C - 3/400

D - 2081/250

Answer - D

Explanation

```
8.324 = 8324/1000 = 2081/250.
```

References

- https://www.splashlearn.com/math-vocabulary/decimals/decimal
- https://www.indiabix.com/aptitude/decimal-fraction/
- https://www.slideshare.net/AdityaKate2/quantitative-aptitudedecimalfractiontest1
- https://www.tutorialspoint.com/quantitative_aptitude/aptitude_decimals.htm
- https://www.mathsisfun.com/decimals.html
- https://brilliant.org/wiki/divisibility-rules/#basic-divisibility-rules
- https://placement.freshersworld.com/quantitative-aptitude-questions-and-answers/number-theory-tips-tricks/3311185246
- https://www.jagranjosh.com/articles/problems-on-number-theory-cat-quantitative-aptitude-1338235593-1