DAY-1

MAH-CET 2024

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FOR BBA/BBM/BMS/BCA

Basic MATHS

NUMBERS

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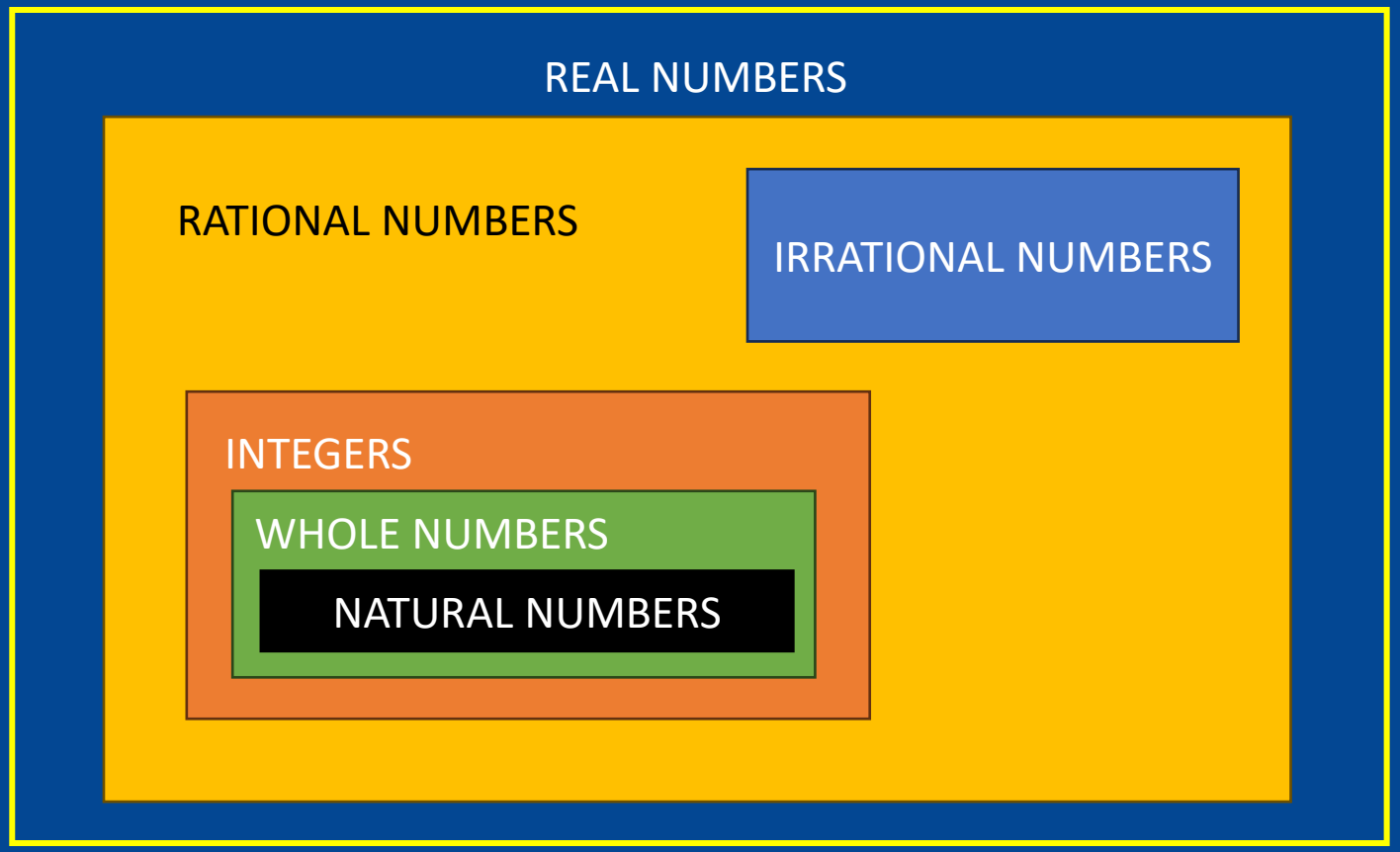
Numbers

Numbers are mathematical objects used to represent quantities.

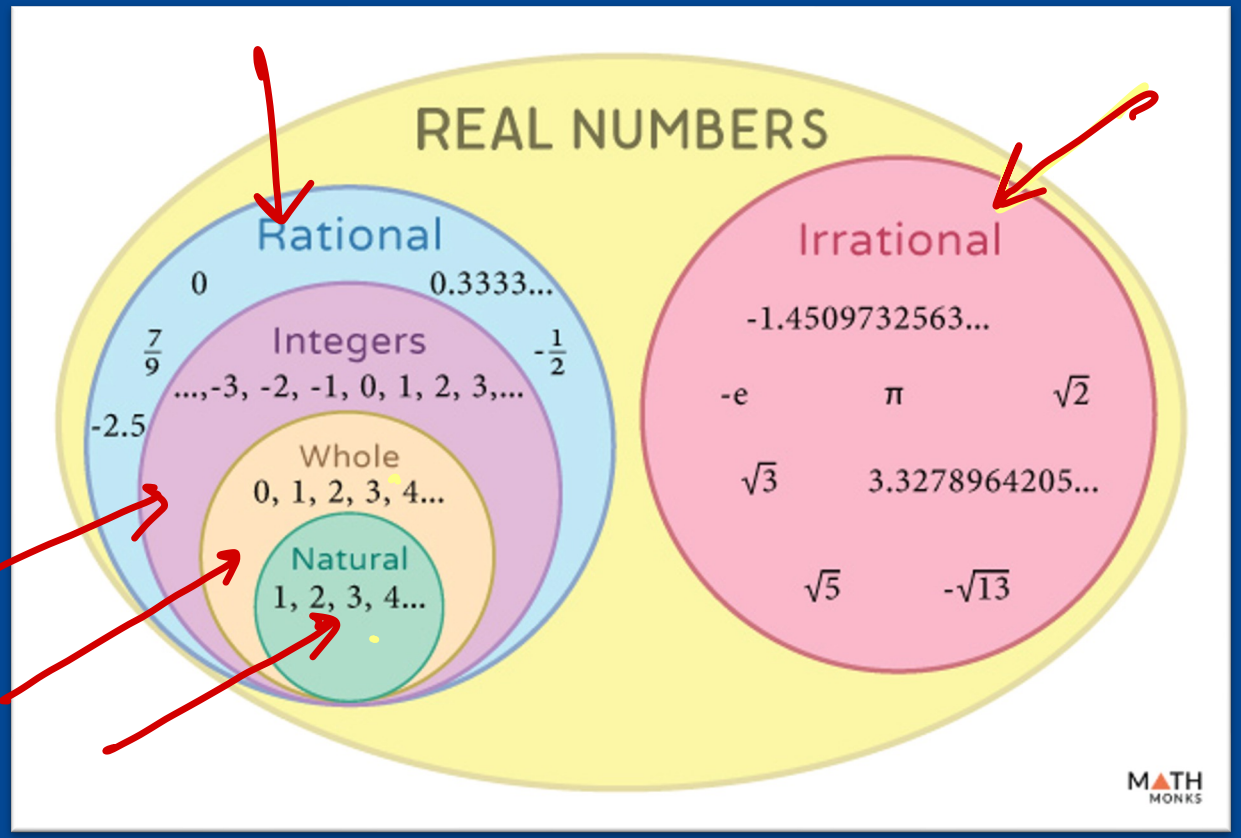
They can be classified into different types based on their properties. Here are some common types of numbers:



Real Numbers (R)

Real numbers can be defined as the union of both rational and irrational numbers.

Symbol : R



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Natural Numbers (N) :

Natural numbers are known as counting numbers that contain the positive integers from 1 to infinity.

Symbol : N

Example : N = {1, 2, 3, 4, 5, ...}

Whole Numbers (W) :

Whole numbers are known as non-negative integers and it does not include any fractional or decimal part.

Symbol : W

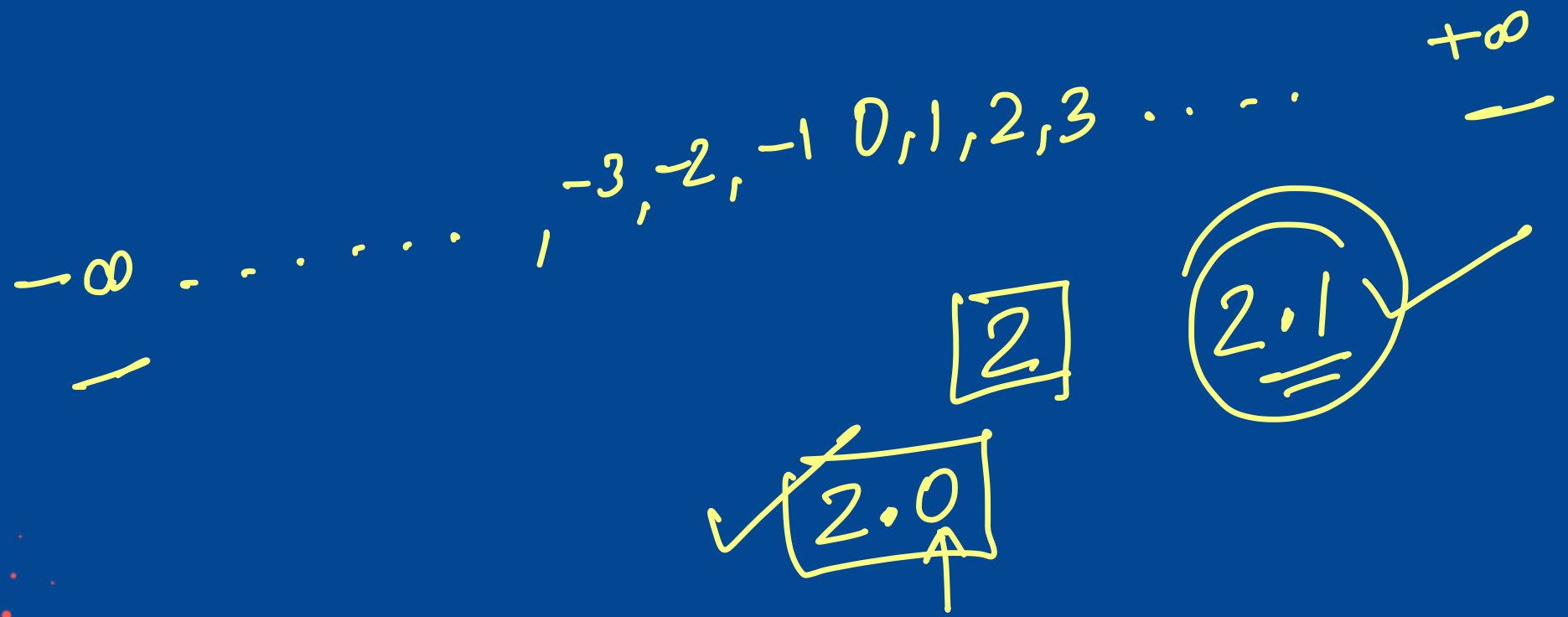
Example : W = {0,1, 2, 3, 4, 5, ...}

Integers (Z) :

Integers are the set of all whole numbers but it includes a negative set of natural numbers also.

Symbol : Z

Example : Z = { -3, -2, -1, 0, 1, 2, 3}



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Rational Numbers (Q) :

Every (I) is a Rational No

- The numbers of the form m/n are called rational numbers.
- Here, m and n are integers but n is not zero.

$\frac{m}{n}$ / $\frac{p}{q}$

Symbol : Q

Example : 1/2, -3/4, 7, etc.

💡 TIP – Recurring or Terminating → 1.5, 2.52, . . .

1.33333 ≈ $1.\overline{3}$

1.525252 . . . ≈ $1.\overline{52}$

Irrational Numbers (P) :

- Irrational numbers are real numbers that cannot be represented as simple fractions.
- An irrational number cannot be expressed as a ratio, such as p/q, where p and q are integers,

Symbol : P

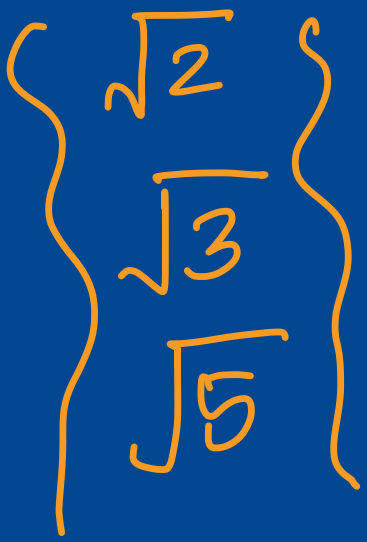
Example : √2, √5, π , -e , -1.4556871….. etc.

$\sqrt{2}$

$\sqrt{3}$

$\sqrt{5}$

💡 TIP – Non-Recurring or Non-Terminating



$\pi, -e$

3.721342

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Apart from the above, there exist other numbers :

Even Numbers : 0, 2, 4, 6, 8

$\frac{0}{0}$ 2 "R = 0"

The numbers which are exactly divisible by 2, are called even numbers. These can be positive or negative integers such as -42, -36, -12, 2, 4, 8 and so on.

Example :

Even Numbers Chart 1 - 100

2	12	22	32	42	52	62	72	82	92
4	14	24	34	44	54	64	74	84	94
6	16	26	36	46	56	66	76	86	96
8	18	28	38	48	58	68	78	88	98
10	20	30	40	50	60	70	80	90	100

Odd Numbers::

R = 1

The numbers which are not exactly divisible by 2, are called odd numbers. These can be both positive and negative integers such as -3, -15, 7, 9, 17, 25 and so on.

1, 3, 5, 7, 9 Odd Nos.

Example :

Odd Numbers Chart 1 - 100

1	11	21	31	41	51	61	71	81	91
3	13	23	33	43	53	63	73	83	93
5	15	25	35	45	55	65	75	85	95
7	17	27	37	47	57	67	77	87	97
9	19	29	39	49	59	69	79	89	99

All Prime Nos. are Odd EXCEPT – "2" – even Prime No

Prime Numbers:

Prime numbers are the numbers that have two factors only. (i.e.,) 1 and the number itself.

In other words, the number which is divided by 1 and the number itself is called prime numbers.

For example: 2, 3, 5, 7, 11, etc.

$18 = 2 \times 3 \times 3 \times 1$

2	18
3	9
3	3
	1

$2 = 2 \times 1$

5	5
	1

$5 = 5 \times 1$

2	3	5	7	11	13	17	19	23	29
31	37	41	43	47	53	59	61	67	71
73	79	83	89	97	101	103	107	109	113
127	131	137	139	149	151	157	163	167	173
179	181	191	193	197	199	211	223	227	229
233	239	241	251	257	263	269	271	277	281
283	293	307	311	313	317	331	337	347	349
353	359	367	373	379	383	389	397	401	409
419	421	431	433	439	443	449	457	461	463
467	479	487	491	499	503	509	521	523	541

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Composite Numbers :

A composite number is a number that has more than two factors.

For example, 4 is a composite number, as the number 4 is divisible by 1, 2, and 4.

Other examples of composite numbers are 6, 8, 9, 10, and so on.

Composite numbers from 1 to 100

4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 27, 28, 30, 32,
33, 34, 35, 36, 38, 39, 40, 42, 44, 45, 46, 48, 49, 50, 51, 52, 54, 55,
56, 57, 58, 60, 62, 63, 64, 65, 66, 68, 69, 70, 72, 74, 75, 76, 77, 78,
80, 81, 82, 84, 85, 86, 87, 88, 90, 91, 92, 93, 94, 95, 96, 98, 99, 100

Addition / Subtraction of numbers

+3 + 5 = 8

+3 +5 = +8

+5 - 3 = 2

+3 - 5 = 3 - 5 = -2

-17 + 2 = -15

- 3 - 5 = -8

$\frac{m}{n} \neq 0$

Identify numbers as Integers, Rational, Irrational

$\frac{4}{3}$ $\quad$ $\frac{\cancel{35}^{5}}{\cancel{7}_{1}}$ $\quad$ $\frac{-\cancel{24}^{-8}}{\cancel{3}_{1}}$ $\quad$ $\sqrt{2}$ $\quad$ $\boxed{-372}$

1.3333....

R $\quad$ 5 $\quad$ −8 $\quad$ IR $\quad$ Integer

Integer $\quad$ Integer

Addition / Subtraction of fractions

$$\frac{4}{5} + \frac{3}{5}$$

$$\frac{4+3}{5}$$

$$= \frac{7}{5}$$

$+8-15$

$$\frac{4}{5} - \frac{3}{2} = \frac{4\times2 - 5\times3}{5\times2}$$

$$= \frac{8-15}{10}$$

$$= \frac{-7}{10}$$

$$= \boxed{\frac{23}{10}}$$

3 x 5 = 15

Multiplication Division of numbers

- 3 x 5 = −15

- 5 x -3 = (−) x (−) = (+) +15

-3 / 5 = $\frac{-3}{5} = -0.6$

- 3 / - 5 = $\frac{+3}{+5} = 0.6$

Multiplication Division of fractions

$$\frac{4}{3} \times \frac{5}{7} = \frac{20}{21}$$

$$\frac{4}{3} \div \frac{12}{6} = \frac{4}{3} \times \frac{6}{12} = \frac{2}{3}$$

Multiplication Division of fractions

$$\frac{4}{3} \times \frac{5}{7}$$

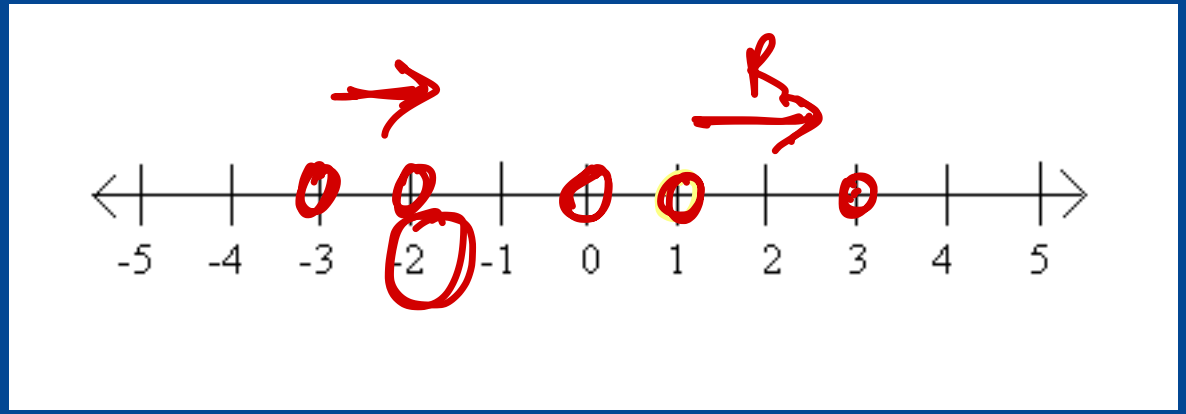
$$\frac{4}{3} \div \frac{12}{6}$$

Comparison of numbers

$4 < 21$

$372 > 72$

$4 > 0$



$-3 < 0$

$-3 < -2$

$1 < 3$

$-3 < 2$

Compare the following numbers.

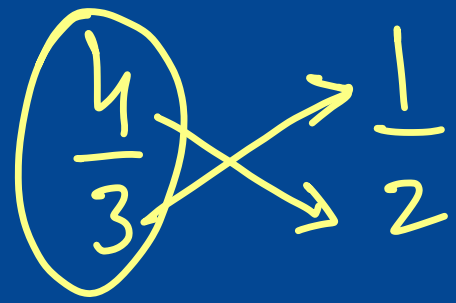
The following rules are useful to compare two rational numbers.

If $\frac{a}{b}$ and $\frac{c}{d}$ are rational numbers such that b and d are positive, and

(1) if $a \times d < b \times c$ then $\frac{a}{b} < \frac{c}{d}$

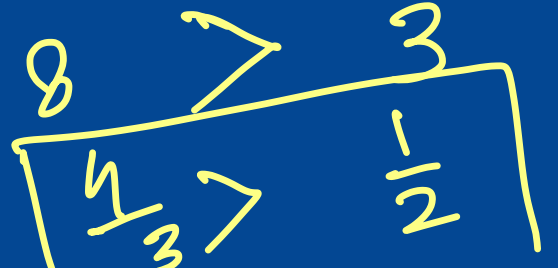
(2) if $a \times d = b \times c$ then $\frac{a}{b} = \frac{c}{d}$

(3) if $a \times d > b \times c$ then $\frac{a}{b} > \frac{c}{d}$



4 x 2

3 x 1



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Compare the numbers $\frac{5}{4}$ and $\frac{2}{3}$. Write using the proper symbol of <, =, >.

$\frac{5}{4} > \frac{2}{3}$

$5 \times 3 \quad 2 \times 4$

$15 > 8$

Decimal representation of rational numbers

$\frac{7}{6} =$

$\frac{-5}{3} =$

$\frac{22}{7} =$

$\frac{7}{6}$

$\boxed{5 \text{ or greater}}$

$6.16666\ldots$

$\approx \boxed{6.17}$

$6.132\ldots$

≈ 6.13

$$
\begin{array}{r}
1.166 \\
6\,\overline{)\,7.0000000\ldots} \\
6 \\
\hline
10 \\
6 \\
\hline
40 \\
36 \\
\hline
40
\end{array}
$$

1. The product of two numbers is -20/9. If one of the numbers is 4, find the other.

(a) –5/9

(b) 3/11

(c) 12/39

(d) –9/11

A

$$4 \times x = \frac{-20}{9}$$

$$x = \frac{-20}{9 \times 4}$$

$$x = \frac{-5}{9}$$

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2. Fill in the blanks: 5/12 ÷ (_____) = -35/18

(a) -21/36

(b) -12/19

(c) -5/18

(d) -3/14

$$\frac{3}{-14} = \frac{-3}{14} = -\frac{3}{14}$$

$$\frac{5}{12} \div \left(\quad\right) = \frac{-35}{18}$$

$$\frac{5}{12} \div \frac{-35}{18} = (x)$$

$$1\quad \frac{5}{\cancel{12}_{2}} \times \frac{\cancel{18}^{3}}{\cancel{-35}_{7}} = -\frac{3}{14}$$

3. The value of (- 16/21 ÷ -4/3) is _____

(a) -3/10

(b) -7/21

(c) 4/7

(d) -7/6

$$\frac{-16}{21} \div \frac{-4}{3} = \frac{\cancel{+16}^{4}}{\cancel{21}_{7}} \times \frac{\cancel{3}^{1}}{\cancel{+4}_{1}}$$

$$= \frac{4}{7}$$

4. The sum of two rational numbers is -7. If one of the numbers is –15/19, the other number is _____

(a) -21/10

(b) -57/16

(c) 7/9

(d) -118/19

(D)

$$\left[\frac{-15}{19}\right] + x = -7$$

$$x = -7 - \left[\frac{-15}{19}\right]$$

$$= \frac{-7}{1} + \frac{15}{19}$$

$$= \frac{-133 + 15}{1 \times 19}$$

$$= \frac{-118}{19}$$

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5. Simplify: 2/3 + -4/5 + 7/15 + -11/20

(a) -1/5 (b) -13/60 (c) -4/15 (d) – 7/30

$$\frac{2}{3} + \left(\frac{-4}{5}\right) + \frac{7}{15} + \left(\frac{-11}{20}\right)$$

HW

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2^3 a^n b^m

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Basic MATHS

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