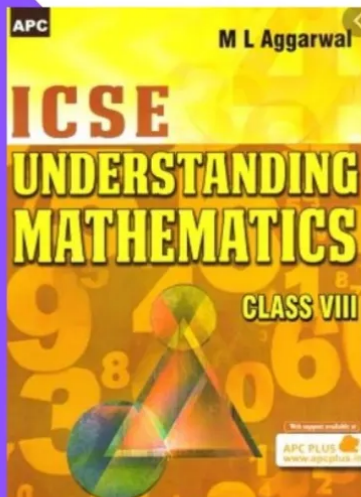


ML Aggarwal Solutions for Class 8 Maths

Chapter 1- Rational Numbers



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ML Aggarwal Solutions

CLASS 8 MATHS

Chapter 1: Rational
Numbers

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ML Aggarwal Solutions for Class 8 Maths

Chapter 1- Rational Numbers

Class 8: Maths Chapter 1 solutions. Complete Class 8 Maths Chapter 1 Notes.

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ML Aggarwal 8th Maths Chapter 1, Class 8 Maths Chapter 1 solutions

Exercise 1.1

1. Add the following:

(i) $4/7$ and $5/7$

(ii) $7/-13$ and $4/-13$

Solution:

(i) Given

$4/7$ and $5/7$

Adding both the numbers

$$4/7 + 5/7 = (4 + 5)/7$$

We get,

$$= 9/7$$

∴ The addition of $4/7$ and $5/7$ is $9/7$

(ii) Given

$7/-13$ and $4/-13$

Consider

$$7/-13 = \{7 \times (-1)\} / \{-13 \times (-1)\}$$

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$$= -7 / 13$$

Also,

$$4 / -13 = \{4 \times (-1)\} / \{-13 \times (-1)\}$$

$$= -4 / 13$$

Now,

Adding both the numbers

$$(7 / -13) + (4 / -13) = (-7 - 4) / 13$$

We get,

$$= -11 / 13$$

2. Simplify:

(i) $5 / 11 +$

(ii) $-4 / 9 +$

Solution:

(i) Given

$$5 / 11 +$$

$$4\frac{3}{9}$$

This can be written as,

$$5 / 11 + 39 / 9$$

Taking L.C.M we get,

$$5 / 11 = (5 \times 9) / (11 \times 9)$$

We get,

$$= 45 / 99$$

$$39 / 9 = (39 \times 11) / (9 \times 11)$$

We get,

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$$= 429 / 99$$

Now,

Adding both the numbers,

$$45 / 99 + 429 / 99 = (45 + 429) / 99$$

$$= 474 / 99$$

99	474	4
	396	
	78	

=

$$4\frac{78}{99}$$

Dividing numerator and denominator by 3,

$$= 4 (78 \div 3) / (99 \div 3)$$

We get,

=

$$4\frac{26}{33}$$

(ii) Given

$$-4 / 9 +$$

$$2\frac{12}{13}$$

This can be written as,

$$-4 / 9 + 38 / 13$$

Taking L.C.M we get,

$$-4 / 9 = (-4 \times 13) / (9 \times 13)$$

We get,

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$$= -52 / 117$$

$$38 / 13 = (38 \times 9) / (13 \times 9)$$

We get,

$$= 342 / 117$$

Now,

Adding both the numbers,

$$-52 / 117 + 342 / 117 = (-52 + 342) / 117$$

We get,

$$= 290 / 117$$

117	290	2
	234	
	56	

=

$$2 \frac{56}{117}$$

3. Verify commutative property of addition for the following pairs of rational numbers.

(i) $-4 / 3$ and $3 / 7$

(ii) $-2 / -5$ and $1 / 3$

(iii) $9 / 11$ and $2 / 13$

Solution:

(i) $-4 / 3$ and $3 / 7$

Adding both the numbers,

$$= -4 / 3 + 3 / 7$$

Taking L.C.M. we get,

$$= (-28 + 9) / 21$$

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$$= -19/21$$

And

$$3/7 + (-4/3)$$

Again taking L.C.M. we get,

$$= (9 - 28) / 21$$

$$= -19/21$$

Therefore,

$$-4/3 + 3/7 = 3/7 + (-4/3)$$

$$(ii) -2/-5 \text{ and } 1/3$$

Consider,

$$-2/-5 = \{-2 \times (-1)\} / \{-5 \times (-1)\}$$

$$= 2/5$$

Now,

$$2/5 + 1/3$$

Taking L.C.M. we get,

$$= (6 + 5) / 15$$

$$= 11/15$$

$$\text{And } 1/3 + 2/5$$

Again taking L.C.M. we get,

$$= (5 + 6) / 15$$

$$= 11/15$$

Therefore,

$$2/5 + 1/3 = 1/3 + 2/5$$

$$(iii) 9/11 \text{ and } 2/13$$

Adding both the numbers,

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$$= 9 / 11 + 2 / 13$$

Taking L.C.M. we get,

$$= (117 + 22) / 143$$

We get,

$$= 139 / 143$$

$$\text{And } 2 / 13 + 9 / 11$$

Again taking L.C.M. we get,

$$= (22 + 117) / 143$$

We get,

$$= 139 / 143$$

Therefore,

$$9 / 11 + 2 / 13 = 2 / 13 + 9 / 11$$

4. Find the additive inverse of the following rational numbers:

(i) $2 / -3$

(ii) $-7 / -12$

Solution:

(i) Given

$$2 / -3$$

Additive inverse of

$$2 / -3 = -(2 / -3)$$

We get,

$$= 2 / 3$$

(ii) Given

$$-7 / -12$$

Additive inverse of

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$$-7 / -12 = -(-7 / -12)$$

We get,

$$= -7 / 12$$

5. Verify that $-(-x) = x$ for

(i) $x = 10 / 13$

(ii) $x = -15 / 17$

Solution:

(i) $x = 10 / 13$

$$-x = -10 / 13$$

$$-(-x) = -(-10 / 13)$$

$$= 10 / 13$$

Hence, $-(-x) = x$

(ii) $x = -15 / 17$

$$-x = 15 / 17$$

$$-(-x) = -(15 / 17)$$

$$= -15 / 17$$

Hence, $-(-x) = x$

6. Using appropriate properties of addition, find the following:

(i) $4 / 5 + 11 / 7 + (-7 / 5) + (-2 / 7)$

(ii) $3 / 7 + 4 / 9 + (-5 / 21) + (2 / 3)$

Solution:

(i) $4 / 5 + 11 / 7 + (-7 / 5) + (-2 / 7)$

$$= 4 / 5 + (-7 / 5) + 11 / 7 + (-2 / 7)$$

$$= \{4 + (-7)\} / 5 + \{11 + (-2)\} / 7$$

$$= (4 - 7) / 5 + (11 - 2) / 7$$

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On further calculation, we get,

$$= -3/5 + 9/7$$

Now, taking L.C.M. we get,

$$= (-21 + 45) / 35$$

$$= 24 / 35$$

$$(ii) 3/7 + 4/9 + (-5/21) + 2/3$$

$$= 3/7 + (-5/21) + 4/9 + 2/3$$

On simplifying, we get,

$$= \{9 + (-5)\} / 21 + (4 + 6) / 9$$

$$= 4/21 + 10/9$$

Taking L.C.M. we get,

$$= (12 + 70) / 63$$

$$= 82 / 63$$

63	82	1
	63	
	19	

=

$$1\frac{19}{63}$$

7. Fill in the blanks:

(i) $(-4/9) + (2/7)$ is a number

(ii) $(43/89) + (-51/47) = \dots\dots\dots + (43/89)$

(iii) $2/7 + \dots\dots\dots = 2/7 = 0 + \dots\dots\dots$

(iv) $4/11 + \{(-7/12) + 9/10\} = \{(4/11) + (-7/12)\} + \dots\dots\dots$

(v) $5/9 + \dots\dots\dots = 0 = (-5/9) + \dots\dots\dots$

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Solution:

(i) $(-4/9) + (2/7)$ is a rational number

(ii) $(43/89) + (-51/47) = (-51/47) + (43/89)$ (Commutative property)

(iii) $2/7 + 0 = 2/7 = 0 + 2/7$ (Commutative property)

(iv) $4/11 + \{(-7/12) + 9/10\} = \{(4/11) + (-7/12)\} + 9/10$ (Associative property)

(v) $5/9 + (-5/9) = 0 = (-5/9) + 5/9$ (Existence of zero property)

8. If $a = -11/27$, $b = 4/9$ and $c = -5/18$, then verify that $a + (b + c) = (a + b) + c$

Solution:

Given

$a = -11/27$, $b = 4/9$ and $c = -5/18$

$a + (b + c) = (a + b) + c$

Consider,

L.H.S. = $a + (b + c)$

= $-11/27 + \{4/9 + (-5/18)\}$

= $-11/27 + (4/9 - 5/18)$

On simplification, we get

= $-11/27 + (8 - 5)/18$

= $-11/27 + 3/18$

Taking L.C.M. we get,

= $(-22 + 9)/54$

= $-13/54$

R.H.S. = $(a + b) + c$

= $(-11/27 + 4/9) + (-5/18)$

On further calculation, we get

= $\{(-11 + 12)/27\} + (-5/18)$

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$$= (1 / 27) + (- 5 / 18)$$

$$= (2 - 15) / 54$$

$$= - 13 / 54$$

Hence,

L.H.S. = R.H.S.

Exercise 1.2

1. Subtract:

(i) from $- 3 / 7$

(ii) $- 4 / 9$ from

(iii) from

Solution:

(i)

$$2\frac{3}{5} \text{ from } - 3 / 7$$

$$= - 3 / 7 - (13 / 5)$$

Taking L.C.M. we get,

$$= (- 15 - 91) / 35$$

$$= - 106 / 35$$

35	106	3
	105	
	1	

=

$$- 3\frac{1}{35}$$

Hence, the subtraction of

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$2\frac{3}{5}$ from $-3/7$ is

$$-3\frac{1}{35}$$

(ii) $-4/9$ from

$$3\frac{5}{8}$$

This can be written as,

$$-4/9 \text{ from } 29/8$$

$$= 29/8 - (-4/9)$$

$$= 29/8 + 4/9$$

Taking L.C.M. we get,

$$= (261 + 32) / 72$$

$$= 293 / 72$$

72	293	4
	288	
	5	

=

$$4\frac{5}{72}$$

(iii)

$$-3\frac{1}{5} \text{ from}$$

$$-4\frac{7}{9}$$

This can be written as,

$$= -16/5 \text{ from } -43/9$$

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$$= -43/9 - (-16/5)$$

$$= -43/9 + 16/5$$

Taking L.C.M. we get,

$$= (-215 + 144) / 45$$

We get,

$$= -71/45$$

45	71	1
	45	
	26	

=

$$-1\frac{26}{45}$$

2. Sum of two rational numbers is $3/5$. If one of them is $-2/7$, find the other.

Solution:

Given

Sum of two rational numbers is $3/5$

One of the number is $-2/7$

Hence, the other number is calculated as follows:

$$\text{Other number} = 3/5 - (-2/7)$$

$$= 3/5 + 2/7$$

Taking L.C.M. we get,

$$= (21 + 10) / 35$$

$$= 31 / 35$$

Therefore, the other number is $31/35$

3. What rational number should be added to $-5/11$ to get $-7/8$?

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Solution:

Given

According to the statement,

Sum of two numbers = $-7/8$

One number = $-5/11$

Hence, the other number is calculated as below:

Other number = $-7/8 - (-5/11)$

= $-7/8 + 5/11$

Taking L.C.M. we get,

= $(-77 + 40) / 88$

= $-37/88$

Therefore, the other number is $-37/88$

4. What rational number should be subtracted from to get ?**Solution:**

The required number can be calculated as follows:

(

$-4\frac{3}{5}) - ($

$-3\frac{1}{2})$

This can be written as,

$(-23/5) + (7/2)$

On further calculation, we get

= $(-46 + 35) / 10$

= $-11/10$

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=

$$-1\frac{1}{10}$$

Therefore, the required number is

$$-1\frac{1}{10}$$

5. Subtract the sum of $-5/7$ and $-8/3$ from the sum of $5/2$ and $-11/12$.

Solution:

Sum of $-5/7$ and $-8/3$ can be calculated as,

$$-5/7 \text{ and } -8/3 = (-5/7) + (-8/3)$$

On further calculation, we get

$$= (-15 - 56) / 21$$

$$= -71 / 21$$

Now,

Sum of $5/2$ and $-11/12$ can be calculated as,

$$5/2 + (-11/12) = 5/2 - 11/12$$

On simplification, we get,

$$= (30 - 11) / 12$$

$$= 19 / 12$$

Now,

$$19/12 - (-71/21)$$

$$= 19/12 + 71/21$$

Taking L.C.M. we get,

$$= (133 + 284) / 84$$

$$= 417 / 84$$

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84	417	4
	336	
	81	

=

$$4\frac{81}{84}$$

=

$$4\frac{27}{28}$$

6. If $x = -4/7$ and $y = 2/5$, then verify that $x - y \neq y - x$

Solution:

Given

$$x = -4/7 \text{ and } y = 2/5$$

Now,

$$x - y = -4/7 - (2/5)$$

$$= -4/7 - 2/5$$

Taking L.C.M. we get,

$$= (-20 - 14) / 35$$

$$= -34 / 35$$

And

$$y - x = 2/5 - (-4/7)$$

$$= 2/5 + 4/7$$

Taking L.C.M. we get,

$$= (14 + 20) / 35$$

$$= 34 / 35$$

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Therefore, $x - y \neq y - x$

7. If $x = 4/9$, $y = -7/12$ and $z = -2/3$, then verify that $x - (y - z) \neq (x - y) - z$

Solution:

Given

$$x = 4/9, y = -7/12, z = -2/3$$

$$x - (y - z) \neq (x - y) - z$$

$$\text{L.H.S.} = x - (y - z)$$

$$= 4/9 - \{-7/12 - (-2/3)\}$$

$$= 4/9 - (-7/12 + 2/3)$$

On further calculation, we get

$$= 4/9 - \{(-7 + 8)/12\}$$

$$= 4/9 - (1/12)$$

$$= 4/9 - 1/12$$

Taking L.C.M. we get,

$$= (16 - 3)/36$$

$$= 13/36$$

Now,

$$\text{R.H.S} = (x - y) - z$$

$$= \{4/9 - (-7/12)\} - (-2/3)$$

$$= (4/9 + 7/12) + 2/3$$

On further calculation, we get

$$= \{(16 + 21)/36\} + 2/3$$

$$= 37/36 + 2/3$$

Again taking L.C.M. we get,

$$= (37 + 24)/36$$

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$$= 58 / 36$$

Therefore, $x - (y - z) \neq (x - y) - z$

8. Which of the following statement is true / false?

(i) $2 / 3 - 4 / 5$ is not a rational number.

(ii) $-5 / 7$ is the additive inverse of $5 / 7$.

(iii) 0 is the additive inverse of its own.

(iv) Commutative property holds for subtraction of rational numbers.

(v) Associative property does not hold for subtraction of rational numbers.

(vi) 0 is the identity element for subtraction of rational numbers.

Solution:

(i) $2 / 3 - 4 / 5$

Taking L.C.M

$$= (10 - 12) / 15$$

$$= -2 / 15$$

Is a rational number

Hence, the given statement is **false**

(ii) The given statement is **true**

(iii) The given statement is **true**

(iv) Let us take,

$$5 / 4 - 3 / 4 = 2 / 4$$

We know that,

$$3 / 4 - 5 / 4 = -2 / 4$$

$$2 / 4 \neq -2 / 4$$

Therefore, the given statement is **false**

(v) The given statement is **true**

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(vi) Let us take,

$$7/8 - 0 = 7/8$$

$$\text{But } 0 - 7/8 = -7/8$$

$$7/8 \neq -7/8$$

Therefore, the given statement is **false**

Exercise 1.3

1. Multiply and express the result in the lowest form:

(i) $6 \div -7 \times 14/30$

(ii)

$$6\frac{2}{3} \times$$

$$1\frac{2}{7}$$

(iii) $25 \div -9 \times -3/10$

Solution:

(i) $6 \div -7 \times 14/30$

$$= (6 \times 14) / (-7 \times 30)$$

We get,

$$= 84 / -210$$

$$= (84 \div 42) / (-210 \div 42)$$

$$\therefore \text{HCF of } 84, 210 = 42$$

$$= 2 / -5$$

$$= \{2 \times (-1)\} / \{-5 \times (-1)\}$$

$$= -2/5$$

(ii)

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$$6\frac{2}{3} \times$$

$$1\frac{2}{7}$$

This can be written as,

$$= 20 / 3 \times 9 / 7$$

$$= (20 \times 9) / (3 \times 7)$$

$$= 180 / 21$$

$$= (180 \div 3) / (21 \div 3)$$

$$\therefore \text{HCF of } 180, 21 = 3$$

We get,

$$= 60 / 7$$

$$=$$

$$8\frac{4}{7}$$

$$\text{(iii) } 25 / - 9 \times - 3 / 10$$

$$= \{25 \times (- 3)\} / \{(- 9) \times 10\}$$

$$= - 75 / - 90$$

$$= \{- 75 \div (- 15)\} / \{- 90 \div (- 15)\}$$

$$\therefore \text{HCF of } 75, 90 = 15$$

We get,

$$= 5 / 6$$

2. Verify commutative property of multiplication for the following pairs of rational numbers:

(i) $4 / 5$ and $- 7 / 8$

(ii) and

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(iii) $-7/5$ and $5/8$

Solution:

(i) $4/5$ and $-7/8$

Now,

$$4/5 \times -7/8$$

$$= \{4 \times (-7)\} / 5 \times 8$$

We get,

$$= -28/40$$

and

$$-7/8 \times 4/5$$

$$= (-7 \times 4) / (8 \times 5)$$

We get,

$$= -28/40$$

Therefore, $4/5 \times (-7/8) = -7/8 \times 4/5$

(ii)

$$13\frac{1}{3} \text{ and } 9\frac{1}{8}$$

$$13\frac{1}{3}$$

This can be written as,

$$40/3 \text{ and } 9/8$$

Now,

$$40/3 \times 9/8$$

$$= (40 \times 9) / (3 \times 8)$$

$$= 360/24$$

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We get,

$$= 15$$

and

$$9 / 8 \times 40 / 3$$

$$= (9 \times 40) / (8 \times 3)$$

$$= 360 / 24$$

We get,

$$= 15$$

$$\text{Therefore, } 40 / 3 \times 9 / 8 = 9 / 8 \times 40 / 3$$

$$\text{(iii) } - 7 / - 20 \text{ and } 5 / - 14$$

$$- 7 / - 20 = \{- 7 \times (- 1)\} / \{- 20 \times (- 1)\}$$

$$= 7 / 20$$

$$\text{Now, } 7 / 20 \text{ and } 5 / - 14$$

$$7 / 20 \times 5 / - 14$$

$$= (7 \times 5) / 20 \times (- 14)$$

$$= 35 / - 280$$

and

$$5 / - 14 \times 7 / 20$$

$$= (5 \times 7) / (- 14 \times 20)$$

$$= 35 / - 280$$

$$\text{Therefore, } 7 / 20 \times 5 / - 14 = 5 / - 14 \times 7 / 20$$

3. Verify the following and name the property also:

$$\text{(i) } 3 / 5 \times (- 4 / 7 \times - 8 / 9) = (3 / 5 \times - 4 / 7) \times - 8 / 9$$

$$\text{(ii) } 5 / 9 \times (- 3 / 2 + 7 / 5) = 5 / 9 \times - 3 / 2 + 5 / 9 \times 7 / 5$$

Solution:

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$$(i) \frac{3}{5} \times (-\frac{4}{7} \times -\frac{8}{9}) = (\frac{3}{5} \times -\frac{4}{7}) \times -\frac{8}{9}$$

$$\text{L.H.S.} = \frac{3}{5} \times (-\frac{4}{7} \times -\frac{8}{9})$$

$$= \frac{3}{5} \times (-4 \times -8) / 7 \times 9$$

$$= \frac{3}{5} \times 32 / 63$$

$$= (3 \times 32) / (5 \times 63)$$

We get,

$$= 96 / 315$$

$$\text{R.H.S.} = (\frac{3}{5} \times -\frac{4}{7}) \times -\frac{8}{9}$$

$$= -\frac{12}{35} \times -\frac{8}{9}$$

$$= \{-12 \times (-8)\} / (35 \times 9)$$

We get,

$$= 96 / 315$$

$$\text{Hence, } \frac{3}{5} \times (-\frac{4}{7} \times -\frac{8}{9}) = (\frac{3}{5} \times -\frac{4}{7}) \times -\frac{8}{9}$$

The name of the property is Associative property of multiplication

$$(ii) \frac{5}{9} \times (-\frac{3}{2} + \frac{7}{5}) = \frac{5}{9} \times -\frac{3}{2} + \frac{5}{9} \times \frac{7}{5}$$

$$\text{L.H.S.} = \frac{5}{9} \times (-\frac{3}{2} + \frac{7}{5})$$

$$= \frac{5}{9} \times \{(-15 + 14) / 10\}$$

We get,

$$= \frac{5}{9} \times (-1 / 10)$$

$$= -5 / 90$$

$$= (-5 \div 5) / (90 \div 5)$$

We get,

$$= -1 / 18$$

$$\text{R.H.S.} = \frac{5}{9} \times (-\frac{3}{2}) + \frac{5}{9} \times \frac{7}{5}$$

On further calculation, we get,

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$$= -15/18 + 35/45$$

Taking L.C.M. we get,

$$= (-75 + 70)/90$$

$$= -5/90$$

$$= (-5 \div 5)/(90 \div 5)$$

$$= -1/18$$

Hence, L.H.S. = R.H.S.

4. Find the multiplication inverse of the following:

(i) 12

(ii) $2/3$

(iii) $-4/7$

(iv) $-3/8 \times (-7/13)$

Solution:

(i) The multiplication inverse of 12 is $1/12$

(ii) The multiplication inverse of $2/3$ is $3/2$

(iii) The multiplication inverse of $-4/7$ is $7/-4$

(iv) $-3/8 \times (-7/13) = 21/104$

The multiplication inverse of $21/104$ is $104/21 =$

$$4\frac{20}{21}$$

5. Using the appropriate properties of operations of rational numbers, evaluate the following:

(i) $2/5 \times -3/7 - 1/14 - 3/7 \times 3/5$

(ii) $8/9 \times 4/5 + 5/6 - 9/5 \times 8/9$

(iii) $-3/7 \times 14/15 \times 7/12 \times (-30/35)$

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Solution:

$$(i) \frac{2}{5} \times -\frac{3}{7} - \frac{1}{14} - \frac{3}{7} \times \frac{3}{5}$$

$$= \frac{2}{5} \times -\frac{3}{7} - \frac{3}{7} \times \frac{3}{5} - \frac{1}{14}$$

Taking common term, we get

$$= -\frac{3}{7} (\frac{2}{5} + \frac{3}{5}) - \frac{1}{14}$$

$$= -\frac{3}{7} \times (\frac{2+3}{5}) - \frac{1}{14}$$

$$= -\frac{3}{7} \times 1 - \frac{1}{14}$$

$$= -\frac{3}{7} - \frac{1}{14}$$

Taking L.C.M. we get,

$$= \frac{-6-1}{14}$$

$$= -\frac{7}{14}$$

$$= \frac{-7 \div 7}{(14 \div 7)}$$

We get,

$$= -\frac{1}{2}$$

$$(ii) \frac{8}{9} \times \frac{4}{5} + \frac{5}{6} - \frac{9}{5} \times \frac{8}{9}$$

$$= \frac{8}{9} \times \frac{4}{5} - \frac{9}{5} \times \frac{8}{9} + \frac{5}{6}$$

Taking common terms, we get,

$$= \frac{8}{9} (\frac{4}{5} - \frac{9}{5}) + \frac{5}{6}$$

$$= \frac{8}{9} \{(\frac{4-9}{5})\} + \frac{5}{6}$$

$$= \frac{8}{9} \times -\frac{5}{5} + \frac{5}{6}$$

$$= \frac{8}{9} \times (-1) + \frac{5}{6}$$

On further calculation, we get

$$= -\frac{8}{9} + \frac{5}{6}$$

Taking L.C.M. we get,

$$= \frac{-16+15}{18}$$

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$$= -1/18$$

$$(iii) -3/7 \times 14/15 \times 7/12 \times (-30/35)$$

$$= (-3/7 \times 14/15) \times (7/12 \times -30/35)$$

On further calculation, we get

$$= -2/5 \times -1/2$$

We get,

$$= 1/5$$

6. If $p = -8/27$, $q = 3/4$ and $r = -12/15$, then verify that

$$(i) p \times (q \times r) = (p \times q) \times r$$

$$(ii) p \times (q - r) = p \times q - p \times r$$

Solution:

Given

$$p = -8/27, q = 3/4 \text{ and } r = -12/15$$

$$(i) p \times (q \times r) = (p \times q) \times r$$

$$\text{L.H.S.} = p \times (q \times r)$$

$$= -8/27 \times (3/4 \times -12/15)$$

$$= -8/27 \times -3/5$$

On further calculation, we get,

$$= \{(-8) \times (-3)\} / (27 \times 5)$$

$$= 24 / (27 \times 5)$$

We get,

$$= 8/45$$

Now,

$$\text{R.H.S.} = (p \times q) \times r$$

$$= (-8/27 \times 3/4) \times -12/15$$

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$$= -2/9 \times -12/15$$

We get,

$$= 8/45$$

Therefore, L.H.S. = R.H.S.

$$(ii) p \times (q - r) = p \times q - p \times r$$

$$\text{L.H.S.} = p \times (q - r)$$

$$= -8/27 \times \{(3/4) - (-12/5)\}$$

Taking L.C.M. we get,

$$= -8/27 \times \{(45 + 48)/60\}$$

$$= -8/27 \times 93/60$$

We get,

$$= -62/135$$

$$\text{R.H.S.} = p \times q - p \times r$$

$$= -8/27 \times 3/4 - (8/27 \times -12/15)$$

$$= -2/9 - 32/135$$

$$= (-30 - 32)/135$$

We get,

$$= -62/135$$

Therefore, L.H.S. = R.H.S.

7. Fill in the following blanks:

(i) $2/3 \times -4/5$ is a number.

(ii) $54/81 \times -63/108 = \dots \times 54/81$

(iii) $4/5 \times 1 = \dots = 1 \times \dots$

(iv) $5/-12 \times \dots = 1 = -12/5 \times \dots$

(v) $3/7 \times (-2/8 \times \dots) = (3/7 \times -2/8) \times 5/9$

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(vi) $-\frac{8}{9} \times \left\{ \frac{4}{13} + \frac{5}{17} \right\} = -\frac{8}{9} \times \frac{4}{13} + \dots\dots\dots$

(vii) $-\frac{6}{13} \times \left\{ \frac{8}{9} - \frac{4}{7} \right\} = -\frac{6}{13} \times \dots\dots\dots - \left(-\frac{6}{13} \right) \times \left(\frac{4}{7} \right)$

(viii) $\frac{16}{23} \times \dots\dots\dots = 0$

(ix) The reciprocal of 0 is $\dots\dots\dots$

(x) The numbers $\dots\dots\dots$ and $\dots\dots\dots$ are their own reciprocals.

(xi) If y be the reciprocal of x , then the reciprocal of y^2 in terms of x will be $\dots\dots\dots$

(xii) The product of a non-zero rational number and its reciprocal is $\dots\dots\dots$

(xiii) The reciprocal of a negative rational number is $\dots\dots\dots$

Solution:

(i) $\frac{2}{3} \times -\frac{4}{5}$ is a rational number.

(ii) $\frac{54}{81} \times -\frac{63}{108} = \dots\dots\dots \times \frac{54}{81}$

$$\frac{54}{81} \times -\frac{63}{108} = -\frac{63}{108} \times \frac{54}{81}$$

(iii) $\frac{4}{5} \times 1 = \dots\dots\dots = 1 \times \dots\dots\dots$

$$\frac{4}{5} \times 1 = \frac{4}{5} = 1 \times \frac{4}{5}$$

(iv) $\frac{5}{-12} \times \dots\dots\dots = 1 = -\frac{12}{5} \times \dots\dots\dots$

$$\frac{5}{-12} \times -\frac{12}{5} = 1 = -\frac{12}{5} \times \frac{5}{-12}$$

(v) $\frac{3}{7} \times \left(-\frac{2}{8} \times \dots\dots \right) = \left(\frac{3}{7} \times -\frac{2}{8} \right) \times \frac{5}{9}$

$$\frac{3}{7} \times \left(-\frac{2}{8} \times \frac{5}{9} \right) = \left(\frac{3}{7} \times -\frac{2}{8} \right) \times \frac{5}{9}$$

(vi) $-\frac{8}{9} \times \left(\frac{4}{13} + \frac{5}{17} \right) = -\frac{8}{9} \times \frac{4}{13} + \dots\dots\dots$

$$-\frac{8}{9} \times \left(\frac{4}{13} + \frac{5}{17} \right) = -\frac{8}{9} \times \frac{4}{13} + -\frac{8}{9} \times \frac{5}{17}$$

(vii) $-\frac{6}{13} \times \left(\frac{8}{9} - \frac{4}{7} \right) = -\frac{6}{13} \times \dots\dots - \left(-\frac{6}{13} \right) \times \left(\frac{4}{7} \right)$

$$-\frac{6}{13} \times \left(\frac{8}{9} - \frac{4}{7} \right) = -\frac{6}{13} \times \frac{8}{9} - \left(-\frac{6}{13} \right) \times \left(\frac{4}{7} \right)$$

(viii) $\frac{16}{23} \times \dots\dots = 0$

$$\frac{16}{23} \times 0 = 0$$

(ix) The reciprocal of 0 is not defined

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- (x) The numbers 1 and -1 are their own reciprocals
- (xi) If y be the reciprocal of x , then the reciprocal of y^2 in terms of x will be x^2
- (xii) The product of a non-zero rational number and its reciprocal is 1
- (xiii) The reciprocal of a negative rational number is a negative rational number

8. If $4/5$ the multiplicative inverse of ? Why or why not?

Solution:

No, the multiplicative inverse of $4/5$ is not $-5/4$

The multiplicative inverse of $4/5$ is $5/4$

9. Using distributivity, find

(i) $\{7/5 \times (-3/12)\} + \{7/5 + 5/12\}$

(ii) $\{9/16 \times 4/12\} + \{9/16 \times (-3/9)\}$

Solution:

(i) $\{7/5 \times (-3/12)\} + \{7/5 + 5/12\}$

Taking common factor, we get

$$= 7/5 \times (-3/12 + 5/12)$$

$$= 7/5 \times \{(-3 + 5)/12\}$$

$$= 7/5 \times 2/12$$

We get,

$$= 7/30$$

(ii) $\{9/16 \times 4/12\} + \{9/16 \times (-3/9)\}$

Taking common factor, we get

$$= 9/16 \times \{4/12 + (-3/9)\}$$

$$= 9/16 \times (1/3 - 1/3)$$

We get,

$$= 9/16 \times 0$$

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$$= 0$$

10. Find the sum of additive inverse and multiplication inverse of 9.

Solution:

The additive inverse of 9 is -9

The multiplicative inverse of 9 is $1/9$

Hence,

$$-9 + 1/9 = (-81 + 1)/9$$

We get,

$$= -80/9$$

=

$$-8\frac{8}{9}$$

11. Find the product of additive inverse and multiplicative inverse of $-3/7$

Solution:

The additive inverse of $-3/7$ is $3/7$

The multiplicative inverse of $-3/7$ is $-7/3$

Therefore,

$$3/7 \times (-7/3) = -1$$

Exercise 1.4

1. Find the value of the following:

(i) $-3/7 \div 4$

(ii) $\div (-4/9)$

(iii) $-8/9 \div -3/5$

Solution:

(i) $-3/7 \div 4$

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$$= -3/7 \times 1/4$$

We get,

$$= -3/28$$

Hence, the value of $-3/7 \div 4 = -3/28$

(ii)

$$4\frac{5}{8} \div (-4/9)$$

This can be written as,

$$= 37/8 \div (-4/9)$$

$$= 37/8 \times 9/-4$$

We get,

$$= 333/-32$$

$$= \{333 \times (-1)\} / \{-32 \times (-1)\}$$

$$= -333/32$$

=

$$-10\frac{13}{32}$$

$$(iii) -8/9 \div -3/5$$

$$= -8/9 \times 5/-3$$

$$= -40/-27$$

$$= \{-40 \times (-1)\} / \{-27 \times (-1)\}$$

We get,

$$= 40/27$$

=

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$$1\frac{13}{27}$$

2. State whether the following statements are true or false:

(i) $-9/13 \div 2/7$ is a rational number.

(ii) $4/13 \div 11/12 = 11/12 \div 4/13$

(iii) $-3/4 \div (5/9 \div -4/11) = (-3/4 \div 5/9) \div -4/11$

(iv) $13/14 \div -5/7 \neq -5/7 \div 13/14$

(v) $(-7 \div 4/5) \div -9/10 \neq -7 \div (4/5 \div -9/10)$

(vi) $-7/24 \div 6/11$ is not a rational number.

Solution:

(i) The given statement is **true**

(ii) The given statement is **false**

Correct: Commutative property is not true for the division

(iii) The given statement is **false**

Correct: Associative in division is not **true**

(iv) The given statement is **true**

(v) The given statement is **true**

(vi) The given statement is **false**

Correct: It is a rational number

3. The product of two rational numbers is $-11/12$. If one of them is , find the other.

Solution:

Given

Product of two rational numbers = $-11/12$

One of the number =

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$$2\frac{4}{9} = 22/9$$

The other number is calculated as below

$$\begin{aligned} & - 11/12 \div 22/9 \\ & = - 11/12 \times 9/22 \end{aligned}$$

We get,

$$= - 3/8$$

Therefore, the other number is $- 3/8$

4. By what rational number should $- 7/12$ be multiplied to get the product as $5/14$?

Solution:

Given

$$\text{Product} = 5/14$$

The required number can be calculated as below

$$\begin{aligned} & 5/14 \div - 7/12 \\ & = 5/14 \times 12/- 7 \end{aligned}$$

We get,

$$\begin{aligned} & = 30/- 49 \\ & = \{30 \times (- 1)\} / \{- 49 \times (- 1)\} \\ & = - 30/49 \end{aligned}$$

Hence, the required number is $- 30/49$

5. By what rational number should $- 3$ is divided to get $- 9/13$?

Solution:

The required number can be calculated as follows:

$$\begin{aligned} & - 3 \div - 9/13 \\ & = - 3 \times 13/- 9 \end{aligned}$$

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We get,

$$= -13 / -3$$

$$= \{-13 \times (-1)\} / \{-3 \times (-1)\}$$

$$= 13 / 3$$

=

$$4\frac{1}{3}$$

Therefore, the required number is

$$4\frac{1}{3}$$

6. Divide the sum of $-13/8$ and $5/12$ by their difference.

Solution:

Given

Sum of $-13/8$ and $5/12$ is calculated as,

$$= -13/8 + 5/12$$

On further calculation, we get

$$= (-39 + 10) / 24$$

We get,

$$= -29 / 24$$

Now,

Difference of $-13/8$ and $5/12$ is calculated as,

$$= -13/8 - 5/12$$

We get,

$$= (-39 - 10) / 24$$

$$= -49 / 24$$

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Now,

$$-29 / 24 \div -49 / 24$$

$$= -29 / 24 \times 24 / -49$$

$$= -29 / -49$$

$$= \{-29 \times (-1)\} / \{-49 \times (-1)\}$$

We get,

$$= 29 / 49$$

7. Divide the sum of $8 / 3$ and $4 / 7$ by the product of $-3 / 7$ and $14 / 9$.

Solution:

Sum of $8 / 3$ and $4 / 7$ is calculated as below

$$8 / 3 + 4 / 7 = (56 + 12) / 21$$

We get,

$$= 68 / 21$$

Product of $-3 / 7$ and $14 / 9$ is calculated as follows:

$$-3 / 7 \times 14 / 9 = -2 / 3$$

Hence,

$$68 / 21 \div -2 / 3 = 68 / 21 \times 3 / -2$$

We get,

$$= 34 / -7$$

$$= \{34 \times (-1)\} / \{-7 \times (-1)\}$$

$$= -34 / 7$$

$$=$$

$$-4\frac{6}{7}$$

8. If $p = -3 / 2$, $q = 4 / 5$ and $r = -7 / 12$, then verify that $(p \div q) \div r \neq p \div (q \div r)$

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Solution:

Given

$$p = -3/2, q = 4/5 \text{ and } r = -7/12$$

$$(p \div q) \div r \neq p \div (q \div r)$$

$$\text{LHS} = (p \div q) \div r$$

$$= (-3/2 \div 4/5) \div (-7/12)$$

$$= (-3/2 \times 5/4) \div (-7/12)$$

$$= -15/8 \div -7/12$$

$$= -15/8 \times 12/-7$$

We get,

$$= -45/-14$$

$$= \{-45 \times (-1)\} / \{-14 \times (-1)\}$$

$$= 45/14$$

Now,

$$\text{RHS} = p \div (q \div r)$$

$$= -3/2 \div (4/5 \div -7/12)$$

$$= -3/2 \div (4/5 \times 12/-7)$$

We get,

$$= -3/2 \div 48/-35$$

$$= -3/2 \times -35/48$$

We get,

$$= 35/32$$

Therefore, LHS $\neq$ RHS

Exercise 1.5

1. Represent the following rational numbers on the number line.

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(i) $11/4$

(ii)

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

(iii) $-9/7$

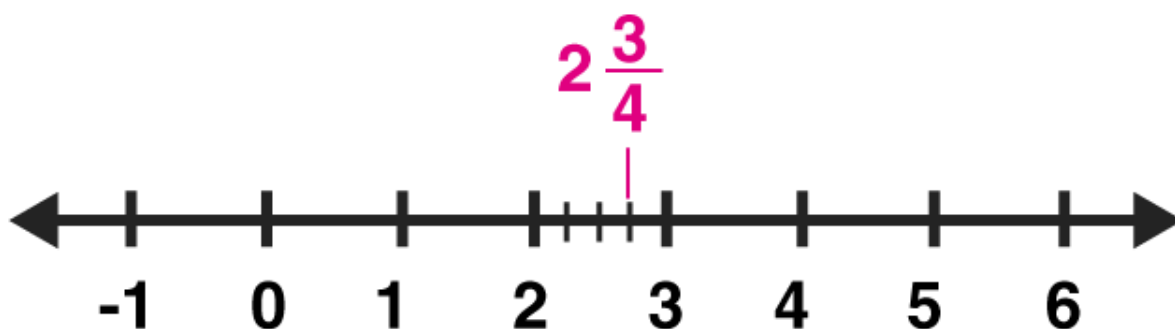
(iv) $-2/-5$

Solution:

(i) $11/4 =$

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

The given rational number on the number line is shown as below:



(ii)

The given rational number on the number line is shown as below

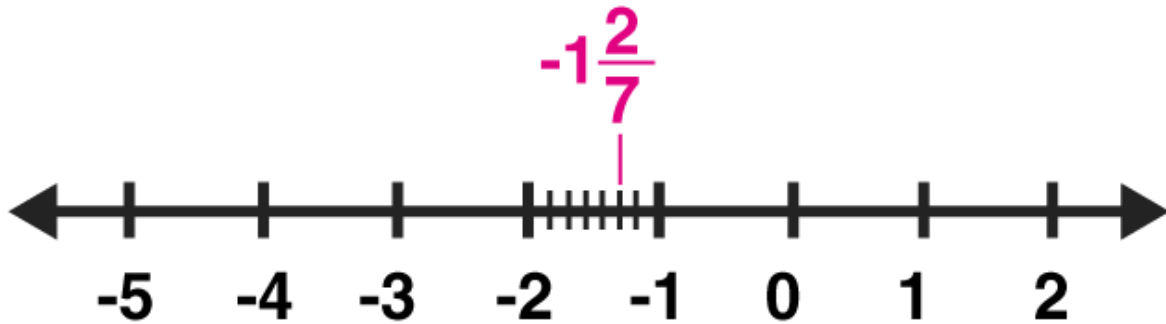


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(iii) $-9/7 =$

$$-1\frac{2}{7}$$

The given rational number on the number line is shown as below



(iv) $-2/-5 = -2 \times (-1) / -5 \times (-1)$

We get,

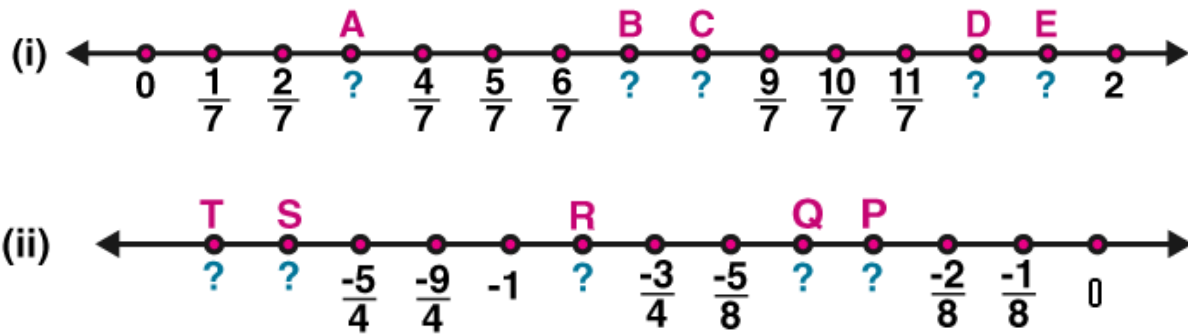
$$= 2/5$$

The given rational number on the number line is shown as below



2. Write the rational numbers for each point labeled with a letter:

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Solution:

(i) The rational numbers for each point labeled with a letter are as follows:

$$A = 3 / 7$$

$$B = 7 / 7 = 1$$

$$C = 8 / 7 =$$

$$1 \frac{1}{7}$$

$$D = 12 / 7 =$$

$$1 \frac{5}{7}$$

$$E = 13 / 7 =$$

$$1 \frac{6}{7}$$

(ii) The rational numbers for each point labeled with a letter are as follows:

$$P = - 3 / 8$$

$$Q = - 4 / 8 \text{ or } - 1 / 2$$

$$R = - 7 / 8$$

$$S = - 11 / 8$$

$$T = - 12 / 8 \text{ or } - 3 / 2$$

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3. Find twenty rational numbers between $-3/7$ and $2/3$ **Solution:**

Twenty rational numbers between $-3/7$ and $2/3$ can be calculated as follows:

We know that,

$$\text{LCM of } 7, 3 = 21$$

Hence,

$$-3/7 = (-3 \times 3) / (7 \times 3)$$

We get,

$$= -9/21$$

$$2/3 = (2 \times 7) / (3 \times 7)$$

We get,

$$= 14/21$$

Now, twenty rational numbers between $-9/21$ and $14/21$ are,

$-8/21, -7/21, -6/21, -5/21, -4/21, -3/21, -2/21, -1/21, 0, 1/21, 2/21, 3/21, 4/21, 5/21, 6/21, 7/21, 8/21, 9/21, 10/21, 11/21, 12/21$ and $13/21$

4. Find six rational numbers between $-1/2$ and $5/4$ **Solution:**

Six rational numbers between $-1/2$ and $5/4$ can be calculated as below

$$\text{LCM of } 2, 4 = 4$$

$$-1/2 = (-1 \times 2) / (2 \times 2)$$

We get,

$$= -2/4$$

Now, six rational numbers between $-1/2$ and $5/4$ are as follows:

$-1/4, 0, 1/4, 2/4, 3/4$ and $4/4$

5. Find three rational numbers between -2 and -1

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Solution:

Three rational numbers between -2 and -1 can be calculated as below:

First rational number = $1/2 (-1 - 2)$

We get,

$$= -3/2$$

Second rational number -2 and $-3/2$

$$= 1/2 \{-2 - (3/2)\}$$

$$= 1/2 (-7/2)$$

We get,

$$= -7/4$$

Third rational number between $-3/2$ and -1

$$= 1/2 \{(-3/2) - 1\}$$

$$= 1/2 (-5/2)$$

$$= 1/2 \times -5/2$$

We get,

$$= -5/4$$

Therefore, three rational numbers are $-7/4, -3/2, -5/4$

6. Write ten rational numbers which are greater than 0.**Solution:**

Ten rational numbers which are greater than 0

There can be the finite number of a rational number greater than 1.

Here, we shall take only 10 rational numbers.

The numbers are as follows:

$(1/2), 1, (3/2), 2, (5/2), 3, (7/2), 4, (9/2), 5$ etc.

7. Write five rational numbers which are smaller than -4

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Solution:

Five rational numbers which are smaller than -4

These can be finite number of rational numbers smaller than -4

Here, we shall take only 5 rational numbers.

The numbers are as follows:

$(-9/2), -5, (-11/2), -6, (-13/2)$, etc.

8. Identify the rational number which is different from the other three. Explain your reasoning

$(-5/11), (-1/2), (-4/9), (-7/3)$

Solution:

Given four rational number are,

$(-5/11), (-1/2), (-4/9), (-7/3)$

Among the given numbers,

$-7/3$ is different from the other three numbers.

Because in $-7/3$ its denominator is less than its numerator

In other numbers, denominators are greater than their numerators respectively.

Exercise 1.6

1. In a bag, there are 20 kg of fruits. If kg of these fruits be oranges and kg of these are apples and rest are grapes. Find the mass of the grapes in the bag.

Solution:

Given

Total fruits in a bag = 20 kg

Oranges =

$7\frac{1}{6}$ kg i.e $43/6$ kg

Apples =

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$$8\frac{2}{3} \text{ kg i.e } 26 / 3 \text{ kg}$$

Remaining fruits in a bag = $20 - \{(43 / 6) + (26 / 3)\}$ kg

$$= 20 - \{(43 + 52) / 6\}$$

On further calculation, we get

$$= 20 - (95 / 6)$$

$$= (120 - 95) / 6$$

$$= 25 / 6$$

=

$$4\frac{1}{6} \text{ kg}$$

Therefore, the mass of the grapes in the bag is

$$4\frac{1}{6} \text{ kg}$$

2. The population of a city is 6, 63,432. If $1 / 2$ of the population are adult males and $1 / 3$ of the population are adult females, then find the number of children in the city.

Solution:

Given

Population of a city = 6, 63,432

Population of adult males = $(1 / 2)$ of 6,63,432

$$= 3,31,716$$

Population of adult females = $(1 / 3)$ of 6,63,432

$$= 2,21,144$$

Remaining population can be calculated as below

$$\text{Remaining population} = 6,63,432 - (3,31,716 + 2,21,144)$$

$$= 6,63,432 - 5,52,860$$

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We get,

$$= 1,10,572$$

Therefore, number of children in a city are 1,10,572

3. In an election of housing society, there are 30 voters. Each of them gives the vote. Three persons X, Y and Z are standing for the post of Secretary. If Mr X got $\frac{2}{5}$ of the total votes and Mr Z got $\frac{1}{3}$ of the total votes, then find the number of votes which Mr Y got.

Solution:

Given

Number of votes = 30

Number of person for election = X, Y, Z

X got $\left(\frac{2}{5}\right)$ of total votes = $\left(\frac{2}{5}\right)$ of 30

$$= \left(\frac{2}{5}\right) \times 30$$

$$= 12$$

Z got $\frac{1}{3}$ of total votes = $\frac{1}{3}$ of 30

$$= \left(\frac{1}{3}\right) \times 30$$

$$= 10$$

Remaining votes can be calculated as below

$$= 30 - (12 + 10)$$

$$= 30 - 22$$

We get,

$$= 8$$

Therefore, Mr Y got 8 votes

4. A person earns Rs 100 in a day. If he spent Rs on food and Rs on petrol. How much did he save on that day?

Solution:

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Given

A person's earning in a day = Rs 100

Money spent on food = Rs

$$14\frac{2}{7} = \text{Rs } 100 / 7$$

Money spent on petrol = Rs

$$30\frac{2}{3} = \text{Rs } 92 / 3$$

The savings of a person is calculated as follows:

$$\text{Savings} = \text{Rs } 100 - \{(100 / 7 + 92 / 3)\}$$

$$= \text{Rs } 100 - \{(300 + 644) / 21\}$$

On further calculation, we get

$$= \text{Rs } 100 - (944 / 21)$$

$$= (2100 - 944) / 21$$

$$= \text{Rs } 1156 / 21$$

= Rs

$$55\frac{1}{21}$$

Hence, a person saved Rs

$$55\frac{1}{21} \text{ on that day.}$$

5. In an examination, 400 students appeared. If $\frac{2}{3}$ of the boys and all 130 girls passed in the examination, then find how many boys failed in an examination?

Solution:

Given

Number of students appeared exams = 400

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(2 / 3) of total boys and all 130 girls passed in the examination

Hence,

Number of total boys = 400 – 130

= 270

Number of boys passed = (2 / 3) of 270

= (2 / 3) × 270

= 180

So, number of boys failed = 270 – 180

= 90

Hence, 90 boys failed in an examination.

6. A car is moving at the speed of $40\frac{2}{3}$ km / h. Find how much distance will it cover in $9\frac{1}{10}$ hrs?

Solution:

Given

Speed of a car =

$$40\frac{2}{3} \text{ km / h} = 122 / 3 \text{ km / h}$$

Distance covered in $9\frac{1}{10}$ hour can be calculated as follows:

$$\text{Distance} = (122 / 3) \times (9 / 10)$$

$$= 366 / 10$$

We get,

$$= 36.6 \text{ km}$$

=

$$36\frac{3}{5} \text{ km}$$

Therefore, the distance covered by the car in $9\frac{1}{10}$ hours is

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$$36\frac{3}{5} \text{ km}$$

7. Find the area of a square lawn whose one side is

$$5\frac{7}{9} \text{ m long.}$$

Solution:

Given

One side of a square lawn =

$$5\frac{7}{9} \text{ m} = 52 / 9 \text{ m}$$

The area of a square lawn can be calculated as follows:

$$\text{Area} = (\text{side})^2$$

$$= (52 / 9)^2$$

We get,

$$= 2704 / 81 \text{ sq. m}$$

=

$$33\frac{31}{81} \text{ sq. m}$$

Therefore, the area of a square lawn is

$$33\frac{31}{81} \text{ sq. m}$$

8. Perimeter of a rectangle is m. If the length is m, find its breadth.

Solution:

Given

Perimeter of a rectangle =

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$$15\frac{3}{7}\text{m}$$

$$= 108 / 7 \text{ m}$$

So,

$$\text{Length} + \text{Breadth} = (108 / 7) \div 2$$

$$= (108 / 7) \times (1 / 2)$$

We get,

$$= 54 / 7 \text{ m}$$

Given length =

$$4\frac{2}{7}$$

$$= 30 / 7 \text{ m}$$

Hence, breadth of a rectangle can be calculated as,

$$\text{Breadth} = (54 / 7) - (30 / 7)$$

$$= 24 / 7$$

=

$$3\frac{3}{7}\text{m}$$

Therefore, the breadth of a rectangle is

$$3\frac{3}{7}\text{m}$$

9. Rahul had a rope of m long. He cut off a m long piece, then he divided the rest of the rope into 3 parts of equal length. Find the length of each part.

Solution:

Given

Length of a rope =

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$$325\frac{4}{5}\text{m}$$

Length of one piece of rope after cut off =

$$150\frac{3}{5}\text{m}$$

Remaining length of a rope can be calculated as below

=

$$325\frac{4}{5}-$$

$$150\frac{3}{5}$$

We get,

=

$$175\frac{1}{5}\text{m}$$

$$= 876 / 5 \text{ m}$$

This length divided into three equal parts

So, length of each part can be calculated as follows:

$$\text{Length of each part} = (876 / 5) \div 3$$

$$= (876 / 5) \times (1 / 3)$$

We get,

$$= 292 / 5 \text{ m}$$

=

$$58\frac{2}{5}\text{m}$$

Therefore, the length of each part of a rope is

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$$58\frac{2}{5}\text{m}$$

10. If 1 litre of petrol costs Rs $3\frac{1}{2}$, then find the cost of 4 litre of petrol.

Solution:

Given

Cost of

$$3\frac{1}{2}\text{litre} = 7 / 2 \text{ litre of petrol} = \text{Rs}$$

$$270\frac{3}{8}$$

$$= \text{Rs } 2163 / 8$$

Hence, the cost of one litre can be calculated as below:

$$\text{Cost of one litre} = \text{Rs } (2163 \times 2) / (8 \times 7)$$

The cost of 4 litre of petrol can be calculated as below

$$\text{Cost of 4 litre} = \text{Rs } (2163 \times 2 \times 4) / (8 \times 7)$$

We get,

$$= \text{Rs } 309$$

Therefore, the cost of 4 litre of petrol is Rs 309

11. Ramesh earns Rs 40,000 per month. He spends $3 / 8$ of the income on food, $1 / 5$ of the remaining on LIC premium and then $1 / 2$ of the remaining on other expenses. Find how much money is left with him?

Solution:

$$\text{Ramesh earnings per month} = \text{Rs } 40,000$$

$$\text{Expenditure on food} = (3 / 8) \text{ of Rs } 40,000$$

$$= \text{Rs } 15,000$$

$$\text{Remaining amount} = 40,000 - 15,000$$

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= Rs 25,000

Expenditure on LIC premium = $(1 / 5)$ of Rs 25,000

= Rs 5000

Remaining amount = Rs 25000 – Rs 5000

= Rs 20,000

Expenditure on other expenses = $(1 / 2)$ of Rs 20,000

= Rs 10,000

Remaining amount left = Rs 20,000 – Rs 10,000

= Rs 10,000

Therefore, the remaining amount left with Ramesh is Rs 10,000

12. A, B, C, D and E went to a restaurant for dinner. A paid $1 / 2$ of the bill, B paid $1 / 5$ of the bill and rest of the bill was shared equally by C, D and E. What fractions of the bill was paid by each?

Solution:

Let us consider the total bill of the restaurant = 1

Bill paid by A = $1 / 2$

Bill paid by B = $1 / 5$

Remaining bill can be calculated as below:

Remaining bill = $1 - \{(1 / 2) + (1 / 5)\}$

= $1 - \{(5 + 2) / 10\}$

= $1 - (7 / 10)$

We get,

= $3 / 10$

Shares of the three persons = $(3 / 10) \div 3$

= $(3 / 10) \times (1 / 3)$

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$$= 1 / 10$$

Therefore, each paid $(1 / 10)$ of the bill.

13. $2 / 5$ of total number of students of a school come by car while $1 / 4$ of students come by bus to school. All the other students walk to school of which $1 / 3$ walk on their own and the rest are escorted by their parents. If 224 students come to school walking on their own, how many students study in the school?

Solution:

Let total number of students be 1

Students who come by car = $2 / 5$

Students who come by bus = $1 / 4$

Students who come by walking = $1 / 3$ of remaining

Rest students = $1 - (2 / 5 + 1 / 4)$

$$= 1 - (8 + 5) / 20$$

$$= 1 - (13 / 20)$$

We get,

$$= 7 / 20$$

Number of students who come by walking can be calculated as below

Number of students who come by walking = $1 / 3$ of $7 / 20$

$$= 7 / 60$$

Now, $7 / 60$ of total students = 224

$$\text{Total students} = (224 \times 60) / 7$$

$$= 32 \times 60$$

$$= 1920$$

Hence, 1920 students study in the school

14. A mother and her two sons got a room constructed for Rs 60,000. The elder son contributes $3 / 8$ of his mother's contribution while the younger son contributes $1 / 2$ of his mother's share. How much do the three contribute individually?

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Solution:

The cost of a room = Rs 60,000

Elder son contribution = $3 / 8$ of his mother's contribution

Younger son contribution = $1 / 2$ of his mother's share

Let the mother contribution be 1

Elder son's contribution = $3 / 8$

Younger son's contribution = $1 / 2$

Now,

Ratios in their share = $1 : (3 / 8) : (1 / 2)$

= 8 : 3 : 4

Sum of ratios = $8 + 3 + 4$

= 15

Therefore,

Mother's share = $(60000 \times 8) / 15$

= Rs 32000

Elder son's share = $(60000 \times 3) / 15$

= Rs 12000

Younger son's share = $(60000 \times 4) / 15$

= Rs 16000

15. In a class of 56 students, the number of boys is $2 / 5$ th of the number of girls. Find the number of boys and girls.

Solution:

Total number of students in a class = 56

Let the number of girls be 1

Then number of boys will be = $2 / 5$ of 1

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$$= 2 / 5$$

Ratios in girls and boys = 1: (2 / 5)

$$= 5: 2$$

$$\text{Number of girls} = \{56 / (5 + 2)\} \times 5$$

$$= (56 / 7) \times 5$$

$$= 40$$

$$\text{And number of boys} = (56 / 7) \times 2$$

$$= 16$$

Therefore, number of boys = 16 and number of girls = 40

16. A man donated $1 / 10$ of his money to a school, $1 / 6$ th of the remaining to a church and the remaining money he distributed equally among his three children. If each child gets Rs 50000, how much money did the man originally have?

Solution:

Let the money of a man be 1

$$\text{Money donated to a school} = 1 / 10$$

$$\text{Remaining money} = 1 - (1 / 10)$$

$$= 9 / 10$$

$$\text{Money donated to a church} = 1 / 6 \text{ of } 9 / 10$$

$$= 3 / 20$$

$$\text{Hence, remaining money} = (9 / 10) - (3 / 20)$$

$$= (18 - 3) / 20$$

$$= 15 / 20$$

A man divides equally to his three children

Hence,

$$\text{Share of each child} = (15 / 20) \div 3$$

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$$= (15 / 20) \times (1 / 3)$$

$$= 1 / 4$$

Here, each child gets Rs 50000

Therefore, his total money = Rs 50000 $\times$ (4 / 1)

$$= \text{Rs } 200000$$

17. If $1 / 4$ of a number is added to $1 / 3$ of that number, the result is 15 greater than half of that number. Find the number.

Solution:

Let us consider the number as x

Then as per the condition,

$$(1 / 4) x + (1 / 3) x - (1 / 2) x = 15$$

$$(3x + 4x - 6x) / 12 = 15$$

$$(1 / 12) x \text{ of a number} = 15$$

$$x = 15 \times 12 / 1$$

$$x = 180$$

Therefore, the required number is 180

18. A student was asked to multiply a given number by $4 / 5$. By mistake, he divided the given number by $4 / 5$. His answer was 36 more than the correct answer. What was the given number?

Solution:

Let the given number be x

According to the condition,

$$x \times 4 / 5 = (4 / 5) x$$

But by mistake a student divides the given number

Then,

$$x \div 4 / 5 = x \times 5 / 4$$

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$$= (5 / 4) x$$

Hence,

$$(5 / 4) x - (4 / 5) x = 36$$

$$(25x - 16x) / 20 = 36$$

$$9x / 20 = 36$$

$$9x = 36 \times 20$$

$$x = (36 \times 20) / 9$$

We get,

$$x = 80$$

Therefore, the given number is 80



ML Aggarwal Solutions Class 8

Maths

- Chapter 1- Rational Numbers
- Chapter 2- Exponents and Powers
- Chapter 3- Squares and Square Roots
- Chapter 4- Cubes and Cube Roots
- Chapter 5- Playing with Numbers
- Chapter 6- Operation On Sets Venn Diagram
- Chapter 7- Percentage
- Chapter 8- Simple and Compound Interest
- Chapter 9- Direct and Inverse Variation
- Chapter 10- Algebraic Expressions and Identities
- Chapter 11- Factorisation
- Chapter 12- Linear Equations and Inequalities in One Variable
- Chapter 13- Understanding Quadrilaterals
- Chapter 14- Constructions of Quadrilaterals
- Chapter 15- Circle
- Chapter 16- Symmetry Reflection and Rotation
- Chapter 17- Visualising Solid Shapes
- Chapter 18- Mensuration
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