

9th CLASS
MATHEMATICS
IIT FOUNDATION
STUDY MATERIAL

1. RATIONAL NUMBERS, PROPERTIES OPERATIONS

TEACHING TASK

JEE MAIN LEVEL QUESTIONS:

- ① Two rational numbers between -2 and -1

$$-\frac{5}{3} = -1.66, \quad -\frac{3}{2} = -1.5$$

Ans: A

② $\frac{1}{3} = 0.3\bar{3}$

$$-\frac{2}{7} = -0.28$$

$$-\frac{4}{3} = -1.33$$

Ascending order is

$$-\frac{4}{3}, -\frac{2}{7}, \frac{1}{3}$$

Ans: B

- ③ Through options:

$$A: \frac{24}{40} = 0.6, \quad \frac{35}{50} = 0.7$$

Ans: B

$$B: \frac{-25}{35} = -0.71, \quad \frac{-55}{77} = -0.71$$

④ Let 'x' be the number

$$-\frac{2}{13} - x = \frac{5}{2}$$

$$\Rightarrow -\frac{2}{13} - \frac{5}{2} = x \Rightarrow \frac{-4-65}{26} = x$$

$$x = -\frac{69}{26} \quad \text{Ans: A}$$

⑤



A: $P+Q$ is rational, the sum of two rationals.

B: $P-Q$ is rational, the difference of two rationals.

C: $P \times Q$ is rational, the product of two rationals.

D: $\frac{P}{Q}$ is rational, the quotient of two rationals.

$\therefore$ All these operations on rational numbers yield rational results. Thus, no option is always true.

Ans:

⑥ The product of two rational numbers is always rational. Ans: B

⑦ Let x be the other number,

$$x \times \frac{-4}{9} = \frac{-28}{27}$$

$$x = \frac{\cancel{28}^7}{\cancel{27}_3} \times \frac{\cancel{9}_3}{\cancel{4}_1}$$

$$x = \frac{7}{3}$$

Ans: B

⑧

✱

$$\frac{2}{3}, \frac{5}{4}, \frac{-7}{6}$$

$$\text{product} = \frac{\cancel{2}^1}{3} \times \frac{5}{\cancel{4}_2} \times \frac{-7}{6}$$

$$= \frac{5 \times (-7)}{3 \times 2 \times 6} = \frac{-35}{36}$$

Ans: Wrong Options

9

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Given $x = \frac{1}{\sqrt{2}+1}$, $y = \frac{\sqrt{2}-1}{\sqrt{2}+1}$

$$\therefore xy = \frac{1}{\sqrt{2}+1} \times \frac{\sqrt{2}-1}{\sqrt{2}+1}$$

$$= \frac{\sqrt{2}-1}{(\sqrt{2}+1)^2} \quad (\because a \times a = a^2)$$

$$((a+b)^2 = a^2 + 2ab + b^2)$$

$$= \frac{\sqrt{2}-1}{(\sqrt{2})^2 + 2(\sqrt{2})(1) + (1)^2}$$

$$= \frac{\sqrt{2}-1}{2+2\sqrt{2}+1} \Rightarrow \frac{\sqrt{2}-1}{3+2\sqrt{2}}$$

Ans: Wrong
option

10

Given cost of $7\frac{2}{3}$ meters = $12\frac{3}{4}$ rupees

$$\Rightarrow \frac{23}{3} \text{ meters} = \frac{51}{4}$$

$$\Rightarrow 1 \text{ meter} = ?$$

$$= \frac{1}{\frac{23}{3}} \times \frac{51}{4} \Rightarrow \frac{51}{4} \times \frac{3}{23} = \frac{153}{92} = 1\frac{61}{92}$$

Ans: C

11) Let a and b are numbers.

$$\text{Sum} \Rightarrow a+b=12$$

$$\text{product} \Rightarrow a \times b = 35$$

Sum of their reciprocals

$$\Rightarrow \frac{1}{a} + \frac{1}{b} \Rightarrow \frac{b+a}{ab}$$

Substitute the values, Ans: B

$$\Rightarrow \frac{b+a}{ab} = \frac{12}{35}$$

12) $\frac{\cancel{7}3\cancel{6}}{\cancel{7}2\cancel{1}6} = \frac{\cancel{3}6^9}{\cancel{2}1\cancel{6}} = \frac{\cancel{9}}{\cancel{5}4^6} = \frac{1}{6}$ Ans: B

13) $-4\frac{3}{4} + 2\frac{7}{12} \Rightarrow -\frac{19}{4} + \frac{31}{12}$

$$\Rightarrow \frac{31}{12} - \frac{19}{4} \Rightarrow \frac{31 - 19 \times 3}{12} = \frac{31 - 57}{12} = \frac{-26}{12} = \frac{-13}{6}$$

Ans: C

14) Let other number is x

$$x \times \frac{-4}{15} = \frac{-9}{16}$$

$$x = \frac{\cancel{-9}}{\cancel{16}} \times \frac{15}{\cancel{4}} = \frac{135}{64}$$

Ans: C

15) Through options

* A: $\frac{b}{a}$ it's a reciprocal of $\frac{a}{b}$

B: $-\frac{a}{b}$, this is the negative of $\frac{a}{b}$, so it's not equivalent.

C: $\frac{1}{a} \times b = \frac{b}{a}$, it is not equivalent to $\frac{a}{b}$

D: $\frac{a}{1-b}$, this is a different expression with a different denominator.

Ans: Wrong options

16) $p^2 = 2q$

If q is rational, then $2q$ is also rational.

$\therefore p^2$ is rational.

Ans: A

17) $x^2 - 3x + 2 = 0$

$$x^2 - 2x - x + 2 = 0$$

$$x(x-2) - 1(x-2) = 0$$

$$(x-2)(x-1) = 0$$

$$x = 1 \text{ (or) } x = 2$$

Ans: B

Both of these values are rational numbers and integers.

ADVANCED LEVEL QUESTIONS

MULTI CORRECT ANSWERS TYPE

① Through options.

A: The sum of two rational number is always rational number.

D: The sum of a rational number and an irrational number may be irrational.

Ans: A and D.

② A: The product of two rational numbers is always rational.

B: is false.

C: The product of a rational number and an irrational number is always irrational.

D: The product of a rational number and an irrational number may be rational. This is can be true if the rational number is zero, otherwise it is generally false.

Ans: A, C and D.

- ③ A: The distributive property holds for addition over multiplication in rational numbers.
B: The distributive property holds for multiplication over addition in rational numbers.

Ans: A and B.

④ $\frac{1}{2} - \frac{3}{4} + \frac{5}{6} - \frac{7}{8}$

$$\Rightarrow \frac{1}{2} + \frac{5}{6} - \frac{3}{4} - \frac{7}{8} \Rightarrow \frac{1 \times 12 + 5 \times 4 - 3 \times 6 - 7 \times 3}{24}$$

$$\Rightarrow \frac{12 + 20 - 18 - 21}{24} = \frac{32 - 39}{24} = -\frac{7}{24}$$

Ans: A and C.

TRUE OR FALSE

⑤

A: 0 do not have Reciprocal

B: 1 Reciprocal is $\frac{1}{1} = 1$

C: -1 Reciprocal is $-\frac{1}{1} = -1$

D: 2 Reciprocal is $\frac{1}{2} = \frac{1}{2}$

Ans: B and C.

REASON AND ASSERTION TYPE

- ⑥ The Sum of two rational numbers is always a rational number, and this is due to the closure property of rational numbers under addition.

Ans: A

- ⑦ The assertion is true: The product of a rational number and an irrational number is always irrational. However, the reason is false because the product of two irrational numbers can be rational.

Ex: $\sqrt{2} \times \sqrt{2} = (\sqrt{2})^2 = 2$. Ans: C

- ⑧ Any integer is indeed a rational number, and rational numbers include integers as a subset.

Ans: A

- ⑨ The assertion is false because the square root of a positive rational number can be rational.

Ex: $\sqrt{4} = 2$. The reason is true because there are rational numbers whose square roots are irrational. Ex: $\sqrt{2}$. Ans: D

STATEMENT TYPE

⑩ Statement-1: The numerator of a standard rational number is indeed an integer.

Statement-11: The denominator of a standard rational number can be a positive or negative integer, but it is not required to be negative.

Ans: C

⑪ The rational number $\frac{3}{8}$ is indeed between $\frac{1}{4}$ and $\frac{2}{3}$.

Statement-11: The formula for finding a rational number between $\frac{a}{b}$ and $\frac{c}{d}$ is not correctly stated. A common method is to use

$\frac{a}{b} + \frac{c}{d}$ or similar. Ans: C

COMPREHENSION TYPE:

⑫ Addition of $\frac{3}{4}$ and $\frac{2}{5}$

$$\frac{3}{4} + \frac{2}{5} = \frac{3 \times 5 + 2 \times 4}{20}$$

$$= \frac{15+8}{20} = \frac{23}{20}. \quad \text{Ans: A}$$

$$(13) \quad \frac{3}{4} - \frac{2}{5} = \frac{3 \times 5 - 2 \times 4}{20}$$

$$\Rightarrow \frac{15-8}{20} = \frac{7}{20} \quad \text{Ans: B}$$

$$(14) \quad \frac{3}{\cancel{4}_2} \times \frac{\cancel{2}^1}{5} = \frac{3}{2 \times 5} = \frac{3}{10} \quad \text{Ans: C}$$

$$(15) \quad \frac{3}{4} \div \frac{2}{5}$$

$$\Rightarrow \frac{3}{4} \times \frac{5}{2} = \frac{15}{8} \quad \text{Ans: D}$$

Comprehension

$$(16) \quad -\frac{3}{7} = -0.42, \quad -\frac{3}{2} = -1.5, \quad -\frac{3}{4} = -0.75$$

Thus, the ascending order is

$$-\frac{3}{2}, -\frac{3}{4}, -\frac{3}{7} \quad \text{Ans: D}$$

$$(17) \quad -\frac{3}{7} = -0.42, \quad -\frac{3}{2} = -1.5, \quad -\frac{3}{4} = -0.75$$

Thus, the descending order is

$$-\frac{3}{2}, -\frac{3}{4}, -\frac{3}{7} \quad \text{Ans: A}$$

Integer type questions:

(18)

$$\frac{5}{8} = \frac{32}{A} \quad (\text{cross multiply})$$

$$5A = 32 \times 8$$

$$A = \frac{32 \times 8}{5} = \frac{\overset{51.2}{\cancel{256}}}{5} = 51.2$$

(19)

$$\text{Add the times, } \frac{33}{12} + \frac{41}{12} + \frac{7}{12} = \frac{33+41+7}{12} = \frac{\overset{27}{\cancel{81}}}{\underset{4}{\cancel{12}}} \text{ hours}$$

$$\Rightarrow \frac{27}{4} \text{ hours}$$

(1 hour = 60 minutes)

$$\Rightarrow \frac{27}{\underset{1}{\cancel{4}}} \times \overset{15}{\cancel{60}} = 27 \times 15 = 405 \text{ minutes.}$$

(20)

The additive inverse of a rational number

$$\frac{2}{5} \text{ is } -\frac{2}{5}$$

$$\text{Sum: } \frac{2}{5} + \left(-\frac{2}{5}\right) \Rightarrow \frac{2}{5} - \frac{2}{5} = 0.$$

Matrix matching type questions

(21)

(a) $-\frac{1}{3}$ additive inverse $\frac{1}{3}$ Ans: r

(b) $-\frac{3}{11}$ additive inverse is $\frac{3}{11}$ Ans: s

(c) $\frac{2}{11}$ additive inverse is $-\frac{2}{11}$ Ans: q

(d) $\frac{9}{2}$ additive inverse is $-\frac{9}{2}$ Ans: p

(22)

(a) $\frac{1}{4} \times \left(\frac{2}{3} + \frac{1}{3}\right) \Rightarrow \frac{1}{4} \times \left(\frac{\cancel{3}^1}{\cancel{3}_1}\right) \Rightarrow \frac{1}{4}$ Ans: r

(b) $\frac{5}{2} \div \left(\frac{2}{1} \times \frac{1}{3}\right) = \frac{5}{2} \div \left(\frac{2}{3}\right) \Rightarrow \frac{5}{2} \times \frac{3}{2} \Rightarrow \frac{15}{4}$ Ans: s

(c) $\frac{\cancel{4}^1}{9} \times \frac{\cancel{6}^1}{\cancel{24}_{\cancel{8}_1}} \div \frac{2}{3} \Rightarrow \frac{1}{9} \times \frac{\cancel{2}^1}{\cancel{2}_1} = \frac{1}{3 \times 2} = \frac{1}{6}$ Ans: p

(d) Reciprocal of $\frac{6}{54}$ is $\frac{54}{6}$

$$\text{product} = \frac{\cancel{6}}{\cancel{54}} \times \frac{\cancel{54}}{\cancel{6}} = 1$$

Ans: 9

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS

① The number which is in the form of $\frac{p}{2}$, from option B is $\frac{3}{2}$. Ans: B

② If p is a positive rational number, then,
 $\frac{p}{p} = 1$ Ans: A

$$\textcircled{3} \quad \frac{\begin{array}{r} 64 \\ -192 \\ \hline 108 \\ 36 \end{array}}{36} = -\frac{64}{36} \quad \text{Ans: B}$$

$$\textcircled{4} \quad \frac{\begin{array}{r} 33 \\ -132 \\ \hline -428 \\ 107 \end{array}}{107} = \frac{33}{-107} \quad \text{Ans: A}$$

⑤ Through options

$$A: \frac{13}{2} \text{ \& } \frac{\overset{13}{\cancel{65}}}{\underset{2}{\cancel{10}}} \Rightarrow \frac{13}{2}, \frac{13}{2} \text{ it is a equivalent}$$

$$B: \frac{\overset{5}{\cancel{15}}}{\underset{12}{\cancel{36}}} \text{ \& } \frac{\overset{7}{\cancel{63}}}{\underset{12}{\cancel{108}}} \Rightarrow \frac{5}{12}, \frac{7}{12} \text{ not equivalent.}$$

$$C: \frac{4}{5} \text{ \& } \frac{\overset{4}{\cancel{16}}}{\underset{5}{\cancel{20}}} \Rightarrow \frac{4}{5}, \frac{4}{5} \text{ equivalent}$$

Ans: B

⑥ $a > b$ and $c < b$,

$$a > b > c$$

through options

A: $c > a$, not possible

B: $c < a$, yes.

Ans: B

C: $b < c$, not possible

D: $b > a$, not possible.

⑦
$$-\frac{5}{7} + \left(\frac{3}{-11} + \frac{-10}{25} \right) = \left(-\frac{5}{7} + \frac{3}{-11} \right) + \frac{-10}{25}$$

it is a Associative property

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

Ans: C

⑧ Options A, B, C are true. Ans: D

⑨ Options A, B, C are true. Ans: D

⑩ $\frac{0}{-6} = 0$, it is neither a positive nor a negative rational number.

Ans: D

⑪ Through options

$$A = \frac{-100}{27}$$

$$B: \frac{\cancel{26}^{13}}{\cancel{83}_3} = \frac{13}{3}$$

$$C: \frac{\cancel{117}^{13}}{\cancel{27}_3} = -\frac{13}{3}$$

$$D: \frac{\cancel{15}^3}{\cancel{25}_5} = \frac{3}{5}$$

∴ Equivalent to $-\frac{13}{3}$ is

$$\Rightarrow \frac{-117}{27}$$

Ans: C

⑫ $\frac{-4}{9} = \frac{-16}{x}$ (cross multiply)

$$-4x = -16 \times 9$$

Ans: A

$$x = \frac{\cancel{-16}^4 \times 9}{\cancel{-4}_1} = 4 \times 9 = 36$$



JEE MAINS LEVEL QUESTIONS

① $\frac{a}{b} + \frac{b}{a} \Rightarrow \frac{axa + bxb}{ab} \Rightarrow \frac{a^2 + b^2}{ab}$ Ans: D

② $x = \frac{2}{3}, y = \frac{5}{4}$
*
 $xy = \frac{2}{3} \times \frac{5}{4} = \frac{1 \times 5}{3 \times 2} = \frac{5}{6}$
 $yx = \frac{5}{4} \times \frac{2}{3} = \frac{5 \times 1}{2 \times 3} = \frac{5}{6}$
 $xy - yx = \frac{5}{6} - \frac{5}{6} = 0$

Ans: Wrong Option.

③ $\frac{x}{y} \times \frac{y}{x} = 1$ Ans: A

④ $x = \frac{p}{q}$ and $y = \frac{q}{r}$

$$xy = \frac{p}{q} \times \frac{q}{r} = \frac{p}{r}$$

$$yx = \frac{q}{r} \times \frac{p}{q} = \frac{p}{r}$$

$$xy - yx = \frac{p}{r} - \frac{p}{r} = 0$$

Ans: Wrong Option.

$$(5) \quad a^2 + b^2 + c^2 = (a+b+c)^2 - 2(ab+bc+ca)$$

Given that $a+b+c = 0$, $a^2 + b^2 + c^2 = 10$

$$10 = (0)^2 - 2(ab+bc+ca)$$

$$10 = -2(ab+bc+ca)$$

Ans: B

$$ab+bc+ca = \frac{10}{-2} = -5$$

(6) For a polynomial equation

$$ax^n + bx^{n-1} + \dots + k = 0$$

In this given polynomial

$$x^3 + 5x^2 + 8x + 4 = 0$$

$\Rightarrow$ The coefficient of x^3 Leading coefficient is 1.

$\Rightarrow$ The coefficient of x^2 is 5.

$$-\frac{b}{a} = \frac{-5}{1} = -5$$

Ans: A

(7) Sum of $-\frac{5}{6}$ and $-1\frac{3}{5}$ is

$$-\frac{5}{6} + (-1\frac{3}{5}) = (-\frac{5}{6} - \frac{8}{5})$$

$$\Rightarrow \frac{-25-48}{30} = \frac{-73}{30}$$

Sum of $2\frac{2}{3}$ and $-6\frac{2}{5}$

$$\Rightarrow 2\frac{2}{3} + (-6\frac{2}{5}) = \frac{8}{3} - \frac{32}{5}$$

$$\Rightarrow \frac{40-96}{15} = -\frac{56}{15}$$

$$\text{Subtraction} = \frac{-56}{15} - (-\frac{73}{30})$$

$$= \frac{-56}{15} + \frac{73}{30}$$

$$= \frac{73 + (-56 \times 2)}{30}$$

$$= \frac{73 - 112}{30}$$

$$= \frac{-39}{30} = -\frac{13}{10}$$

Ans: A

$$\textcircled{8} \left(\frac{3}{7} \times \frac{-5}{8} \right) \div \left(\frac{1}{3} \times \frac{5}{6} \right) + \left(\frac{1}{2} + \frac{1}{5} \right)$$

$$= \left(\frac{-15}{56} \right) \div \left(\frac{5}{18} \right) + \frac{7}{10}$$

$$\Rightarrow \frac{-15}{56} \times \frac{18}{5} + \frac{7}{10}$$

$$\Rightarrow \frac{-27}{28} + \frac{7}{10}$$

$$\Rightarrow \frac{7 \times 28 - 27 \times 10}{280}$$

$$= \frac{196 - 270}{280} = \frac{-74}{280} = \frac{-37}{140}$$

Ans: C

$$\textcircled{9} \frac{2}{9} \times \frac{3}{8} = \frac{3}{4} \quad \text{Ans: B}$$

$$\textcircled{10} -\frac{7}{8} - \left(-\frac{5}{6} \right)$$

$$\Rightarrow -\frac{7}{8} + \frac{5}{6}$$

$$\Rightarrow \frac{5}{6} - \frac{7}{8}$$

$$= \frac{40 - 42}{48}$$

$$= -\frac{2}{48} \Rightarrow -\frac{1}{24}$$

Ans: A

⑪ $-\frac{2}{3} = 0.66$, $\frac{4}{5} = 0.8$, $\frac{6}{7} = 0.85$, $-\frac{1}{6} = -0.16$

$$-\frac{2}{3} < -\frac{1}{6} < \frac{4}{5} < \frac{6}{7} \quad \text{Ans: D}$$

⑫ Rational numbers between $-\frac{2}{3}$ & -1

$$-1 - \left(-\frac{2}{3}\right) = -1 + \frac{2}{3} = -\frac{3}{3} + \frac{2}{3} = -\frac{1}{3}$$

Now, divide this difference by 6,

$$-\frac{1/3}{6} = -\frac{1}{18}$$

$\therefore$ the five rational numbers between $-\frac{2}{3}$ and -1 are

$$-\frac{13}{18}, -\frac{7}{9}, -\frac{8}{9}, -\frac{17}{18}, -1 \quad \text{Ans: B}$$

⑬ $\frac{5}{7} \times x = \frac{10}{7}$

$$x = \frac{10}{7} \times \frac{7}{5} \quad \text{Ans: A}$$

$$x = 2$$

⑭ $-\frac{1}{3} = 0.33$, $-\frac{4}{3} = -1.33$, $-\frac{2}{9} = 0.22$

descending order $\Rightarrow -\frac{2}{9} > -\frac{1}{3} > -\frac{4}{3} \quad \text{Ans: A}$

$$(15) \quad \frac{-17}{18} \times (-\frac{1}{3}) \times \frac{18}{30} = \frac{17 \times 18}{30} = \frac{17 \times 6}{10} = \frac{17 \times 3}{5} = \frac{51}{5}$$

Ans: B

$$(16) \quad \text{Water melon} = 3\frac{1}{2} \text{ kg} \Rightarrow \frac{7}{2} \text{ kg}$$

$$\text{Apple} = \frac{5}{6} \text{ kg}$$

$$\text{Grapes} = \frac{3}{4} \text{ kg}$$

$$\text{Total weight} = \frac{7}{2} + \frac{5}{6} + \frac{3}{4} \Rightarrow \frac{7 \times 6 + 5 \times 2 + 3 \times 3}{12}$$

$$\Rightarrow \frac{42 + 10 + 9}{12} \Rightarrow \frac{61}{12} \Rightarrow 5\frac{1}{12} \text{ kg.} \quad \text{Ans: D}$$

ADVANCED LEVEL QUESTIONS

Multi correct answer type:

(1) A: This applies to both addition and multiplication.

B: For multiplication, the identity element is 1 as

$$a \times 1 = a$$

C: For multiplication the inverse of a is $\frac{1}{a}$

$$\text{Since } a \times \frac{1}{a} = 1$$

D: The set of rational number is closed under multiplication, meaning the product of any two rational number is also a rational number.

Ans: A, B, C, D

② A: The set of rational number is closure under addition and subtraction.

B: Addition and subtraction of rational number are associative, $\left(\frac{a}{b} + \frac{c}{d}\right) - \frac{e}{f} = \frac{a}{b} + \left(\frac{c}{d} - \frac{e}{f}\right)$

Ans: A and B.

③ A: Every integer n can be expressed as $\frac{n}{1}$.

C: A fraction is a quotient of two integers, where the denominator is not zero.

D: Every rational number can be expressed as a fractional of two integers, where the denominator is not zero.

Ans: A, C and D.

④ Commutative property: addition $\Rightarrow a+b = b+a$
Multiplication $\Rightarrow a \times b = b \times a$

Associative property: Addition $\Rightarrow (a+b)+c = a+(b+c)$

Multiplication $\Rightarrow (a \times b) \times c = a \times (b \times c)$

Identity element: Addition: The identity element

is 0 because $a+0 = 0+a = a$.

Multiplication: $(a \times 1) = 1 \times a = a$.

Distributive property: $a \times (b+c) = (a \times b) + (a \times c)$

Ans: A, B, C and D

REASON AND ASSERTION TYPE

- ⑤ The sum of two rational number is always rational because rational numbers are closure under addition.

Reason: The sum of a rational number and an irrational number is always irrational.

Ans: B

- ⑥ Assertion: The square of any rational number is rational because the product of two rational numbers is rational.

Reason: The square root of a positive rational number is not necessarily rational.

Ans: C

- ⑦ Assertion: The set of rational numbers is closure under subtraction.

Reason: The difference of two rational number is always a rational number.

Statement Type:

- ⑨ Statement-I: Between any two rational numbers, you can always find another rational number and this process can be repeated indefinitely, showing that there are infinitely many rational numbers between any two given rational numbers.

Statement-II: The product of two negative rational numbers is a positive rational number because multiplying two negative numbers results in a positive number.

Ans: C

Comprehension Type:

- ⑩ The additive inverse of a rational number 'a' is '-a'.

∴ the sum of a rational number and its additive inverse is $a + (-a) = 0$.

Ans: A

- ⑪ $\frac{3}{5}$ and $\frac{4}{7}$

product: $\frac{3}{5} \times \frac{4}{7} = \frac{12}{35}$ Ans: B

(12) Area of Rectangle = $l \times b$

$$= 18\frac{2}{5} \times 12\frac{1}{2}$$

$$= \frac{((18 \times 5) + 2)}{5} \times \frac{((12 \times 2) + 1)}{2}$$

$$= \frac{92}{5} \times \frac{25}{2}$$

$$= 46 \times 5$$

$$= 230 \text{ m}^2$$

Ans: B

Integer Type:

(13) $2 - \frac{3}{4} \times (-\frac{2}{3})$

$$= 2 + \frac{1}{2} \times \frac{2}{1}$$

$$= 2 + \frac{2}{2} \Rightarrow \frac{4+2}{2}$$

(14) $2\frac{1}{4} = 2 + \frac{1}{4} = \frac{8}{4} + \frac{1}{4} = \frac{9}{4} \text{ meters}$

Number of pieces = $\frac{90}{9/4} \Rightarrow 10 \times \frac{4}{1} \Rightarrow 10 \times 4 = 40$

$\therefore$ 40 pieces of $2\frac{1}{4}$ meters can be cut from a 90 meters long rope.

Matrix matching type:

(15)

(a) $\frac{\overset{11}{\cancel{22}}}{\overset{-42}{\cancel{21}}} = \frac{11}{-21}$ ans: q

(b) $\frac{\overset{4}{\cancel{12}}}{\overset{-21}{\cancel{7}}} = \frac{4}{7}$ Ans: p

(c) $\frac{\overset{27}{\cancel{30}}}{\overset{10}{\cancel{10}}} = \frac{9}{10}$ Ans: s ✱

(d) $\frac{\overset{4}{\cancel{32}}}{\overset{56}{\cancel{7}}} = -\frac{4}{7}$ Ans: r
