3. OPERATIONS ON FRACTIONS
Class: VII, MATHEMATICS ①
INTEGRATED: SOLUTIONS

2025/26

TEACHING TASK

JEE MAINS

01. $x + \frac{1}{3} = \frac{7}{12} \Rightarrow x = \frac{7}{12} - \frac{1}{3} = \frac{7-4}{12} = \frac{1}{4}$ Ans: A

02 Since there are 5 friends.
Each shared $\frac{1}{5}$ of the orginal car
Ans: B

03 Anu eats $= \frac{7}{16}$

Teja eats $= \frac{1}{4} \times \frac{4}{4} = \frac{4}{16}$

Total cake 16 equal parts

$\therefore$ Remaing $= 1 - \left(\frac{7}{16} + \frac{4}{16}\right)$

$= \frac{5}{16}$ Ans: A

04 $\left(\frac{10}{5} \times \frac{3}{6}\right) + \left(\frac{2}{3} \times \frac{6}{2}\right) - \frac{8}{4}$ of $\frac{14}{7}$

$= (1) + 2 - \frac{8}{4} \times \frac{14}{7}$

$= 3 - 4$

$= -1$ Ans: A

05 $\left[\frac{5}{4} + \left(\frac{6}{10} \times \frac{5}{4}\right) - \left(\frac{3}{4} \times \frac{4}{6}\right) + \frac{1}{2}\right]$ of $\frac{3}{4}$ (2)

$= \left[\frac{5}{4} + \frac{3}{4} - \frac{1}{2} + \frac{1}{2}\right] \times \frac{3}{4}$

$= \left[\frac{8}{4}\right] \times \frac{3}{4} = \frac{2}{8} \times \frac{3}{4} = \frac{3}{8}$ Ans: D

06 $12\frac{1}{2} + 12\frac{1}{3} + 12\frac{1}{6}$

$= \frac{25}{2} + \frac{37}{3} + \frac{73}{6}$

$= \frac{75+74+73}{6} = \frac{222}{6} = 37$ Ans: B

07 $\frac{2x}{1 + \frac{1}{1+\left(\frac{x}{1-x}\right)}} = 1$

$\Rightarrow \frac{2x}{1 + \frac{(1-x)}{1}} = 1$

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

$\Rightarrow 2x = 2 - x$

$\Rightarrow x = \frac{2}{3}$

Ans: C

08 $\frac{1}{3} + \frac{2}{5} - \frac{1}{4}$

$= \frac{20 + 24 - 15}{60} = \frac{29}{60}$ Ans: A

09 $\frac{2}{3} \div \left(\frac{4}{5} - \frac{1}{2}\right)$

$= \frac{2}{3} \div \left(\frac{3}{10}\right)$

$= \frac{2}{3} \times \frac{10}{3} = \frac{20}{9}$

Ans: D

10 $3\frac{3}{5} = \frac{18}{5} = 3.6$

$2\frac{4}{7} = \frac{18}{7} = 2.5$

$\frac{19}{6} = 3.1$

$\frac{18}{8} = 2.2$

Greatest $= \frac{18}{5}$

least $= \frac{18}{8} = \frac{9}{4}$

Difference $= \frac{18}{5} - \frac{9}{4}$

$= \frac{27}{20}$ Ans A

11 $\left(\frac{2}{5} + \frac{3}{5}\right) \div \left(\frac{7}{5} - \frac{4}{10}\right)$

$= (1) \div \left(\frac{14-4}{10}\right)$

$= 1 \div 1 = 1$

Ans. A

12 $3\frac{1}{4} + \frac{1}{2} \div \frac{3}{4} - \frac{1}{2} \times 3\frac{1}{2}$

$= \frac{13}{4} + \frac{1}{2} \times \frac{4}{3} - \frac{1}{2} \times \frac{7}{2}$

$= \frac{13}{4} + \frac{4}{6} - \frac{7}{4}$

$= \frac{39+8-21}{12} = \frac{26}{12} = \frac{13}{6} = 2\frac{1}{6}$

Ans. A

13 Side of a square $= 6\frac{2}{3} = \frac{20}{3}$

Area $= \left(\frac{20}{3}\right)^2 = \frac{400}{9} = 45$ km^2 (Approx) Ans. B

14 $x \times \frac{20}{3} = \frac{145}{7}$

$\Rightarrow x = \frac{145}{7} \times \frac{3}{20} = \frac{87}{28}$

Ans. D

15 $\frac{a}{b} \times \frac{b}{c} = \frac{3}{4} \times \frac{5}{6} = \frac{15}{24} = \frac{5}{8}$ (4) Ans. A

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16 Given fraction $\frac{2}{3}$

B) reciprocal $\frac{3}{2}$ ✓

C) $\frac{2}{3} \times \frac{2}{2} = \frac{4}{6}$ ✓

Ans. B, C

17 $\frac{a}{b} < \frac{c}{d}$

$\Rightarrow ad < bc$ (or)

$\frac{1}{4} < \frac{1}{2}$

$a - b = 1 - 4 = -3$

$c - d = 1 - 2 = -1$

$\therefore a - b < c - d$

Ans: A, D

18 $2\frac{3}{5} + \frac{1}{4}$

$= \frac{13}{5} + \frac{1}{4}$

$= \frac{52 + 5}{20} = \frac{57}{20}$

$= 2\frac{17}{20}$ hr

Ans: A, C

19 $\frac{2}{3} = 0.67$; $\frac{5}{6} = 0.83$

A) $\frac{3}{4} = 0.75$ ✓

B) $\frac{7}{10} = 0.7$ ✓

C) $\frac{5}{4} = 1.2$ ✗

D) $\frac{10}{7} = 1.4$ ✗

Ans. A, B

20 Assertion: $\frac{1}{3} > \frac{2}{5} \Rightarrow 5 > 6$ (False)

Reason: Conceptual (True)

Ans. D

21. Assertion: Conceptual (True) (5)

Reason: Conceptual (True) Ans. A

22 Statement I: $\frac{8+9+10}{25} = \frac{27}{25}$ (True)

Statement II: Conceptual (True) Ans. A

23 Statement I: $\frac{24}{25} \times \frac{5}{8} = \frac{3}{5}$ (False)

Statement II: Conceptual (True) Ans. D

24 12 chocolates $\rightarrow \frac{4}{6} \times 216 = 144$ kg

1 Chocolate $\rightarrow \frac{144}{12} = 12$ kg

15 Chocolates $\rightarrow 15 \times 12 = 180$ kg Ans. B

25 $\frac{3}{5} + \frac{2}{5} = \frac{3+2}{5} = \frac{5}{5} = 1$ Ans. 1

26 $\frac{9}{2} + \frac{\frac{3}{2} \times \frac{4}{6}}{\frac{5}{3} \times \frac{6}{5}} - 1$

$= \frac{9}{2} + \frac{1}{2} - 1$

$= 5 - 1 = 4$ Ans. 4

27 a) $9\frac{3}{4} + 7\frac{7}{6} + 3\frac{5}{12}$

$= \frac{39}{4} + \frac{49}{6} + \frac{41}{12}$

$= \frac{117 + 98 + 41}{12} = \frac{256}{12} = 21\frac{1}{3}$

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

$= \frac{13}{4} - \frac{11}{6} + \frac{19}{8}$

$= \frac{78 - 44 + 57}{24} = \frac{91}{24} = 3\frac{19}{24}$

c) $9\frac{5}{4} - 6\frac{8}{21} + \frac{25}{42}$

$= \frac{41}{4} - \frac{134}{21} + \frac{25}{42}$

$= \frac{393 - 268 + 25}{42} = \frac{150}{42} = 3\frac{4}{7}$

d) $2\frac{1}{8} - \frac{7}{12} - \frac{23}{24}$

$= \frac{17}{8} - \frac{7}{12} - \frac{23}{24}$

$= \frac{51 - 14 - 23}{24} = \frac{14}{24} = \frac{7}{12}$

Ans. 9, P, R, S

LEARNER'S TASK (CUES)

01. $\frac{2}{3} + \frac{1}{4} = \frac{8+3}{12} = \frac{11}{12}$ Ans. B

02 $x = \frac{3-1}{5} = \frac{4}{5}$ Ans: D

03. $\frac{e}{3} \times \frac{5}{4} = \frac{5}{6}$ Ans: A

04 $\frac{15}{7} \times \frac{28}{45} = \frac{4}{3}$ Ans: B

05 $\frac{80}{9} \times \frac{7}{16} = \frac{x}{9} \Rightarrow x = 35$ Ans: A

06 $x = \frac{9}{8} - \frac{39}{56} = \frac{63-39}{56} = \frac{24}{56} = \frac{3}{7}$ Ans: C

07 Two hours $\rightarrow \frac{30}{4}$ km

4 hours $\rightarrow \frac{30}{4} \times 2 = 15$ km Ans: B

08 Ground left $= 1 - \frac{2}{3} = \frac{1}{3}$ Ans: A

09 $\frac{x}{2}$ Ans: C

10 $\frac{5}{3}$ Ans: C

11 $\frac{16}{5 \times 2} = \frac{16}{10} = \frac{8}{5} = 1\frac{3}{5}$

5) 8 (1
5
3 Ans D

12 Total juice in 24 days $= \frac{3}{8} \times 24 = 9$ lit Ans: B

13 $\frac{1}{x} = 2 - \frac{1}{2} = \frac{3}{2}$ Ans: B

14 $y = \frac{4}{7} \times \frac{3}{2} = \frac{6}{7}$ Ans: A

JEE MAINS LEVEL

01. $\frac{a}{b} \times \frac{b}{c} = \frac{2}{3} \times \frac{3}{4} \Rightarrow \frac{a}{c} = \frac{1}{2}$ Ans: A

02 $\frac{p+q}{p-q} = \frac{\left(\frac{p}{q}\right)+1}{\left(\frac{p}{q}\right)-1} = \frac{\frac{1}{2}+1}{\frac{1}{2}-1} = \frac{\left(\frac{3}{2}\right)}{\left(-\frac{1}{2}\right)} = -3$

Ans: —

03 left un painted $= 1-\left(\frac{2}{3}+\frac{1}{5}\right)$

$= 1-\left(\frac{13}{15}\right) = \frac{2}{15}$

Ans. C

04 Ravi has $= 1-\left(\frac{1}{7}+\frac{2}{7}\right)$

$= 1-\frac{3}{7} = \frac{4}{7}$

Ans. D

05 $\frac{1}{8}+\frac{3}{4} = \frac{1+6}{8} = \frac{7}{8}$

Ans: A

06 A) $\frac{3}{4}+\frac{1}{5} = \frac{19}{20}$ (proper fraction) X

B) $\frac{1}{4}+\frac{3}{5} = \frac{17}{20}$ X

C) $\frac{5}{8}+\frac{3}{4} = \frac{11}{8} = 1\frac{3}{8}$

8) $11 \cup \frac{8}{3}$

Ans. C

07 $\frac{4}{10}+\frac{5}{100}+\frac{7}{1000}$

$= \frac{400+50+7}{1000} = \frac{457}{1000}$

Ans C

08 $\frac{21}{5}-\left[\frac{10}{3}-\left\{\frac{5}{2}-\left(\frac{4+2-1}{12}\right)\right\}\right]$

$= \frac{21}{5}-\left[\frac{10}{3}-\frac{5}{2}+\frac{5}{12}\right] = \frac{21}{5}-\frac{15}{12} = \frac{59}{20}$

Ans. A

09 $\frac{21}{6} - \frac{31}{9} + x = \frac{7}{8} \times \frac{88}{6}$

$\Rightarrow x = \frac{175}{18} - \frac{31}{6} + \frac{29}{9}$

$= \frac{175 - 93 + 62}{18} = \frac{144}{18} = 8$ Ans. A

10 please change the question: "what part of the book unread by manish?"

Manish Unread $= 1 - \frac{5}{6} = \frac{1}{6}$ Ans. B

11 Area $= 41\frac{2}{3} \times 18\frac{3}{5}$

$= \frac{125}{3} \times \frac{93}{5}$

$= 775 \text{ m}^2$ Ans. D

12 Cost per kg $= \frac{101\frac{1}{4}}{5\frac{2}{5}} = \frac{405}{4} \times \frac{5}{27} = \frac{75}{4}$

$= 18\frac{3}{4}$ Ans. A

JEE ADVANCED LEVEL

13 option: B, C are conceptually true Ans. B, C

14 $\frac{P}{Q} = \frac{2}{3} \Rightarrow \frac{3P}{2Q} = \frac{2 \times 2}{2 \times 3} = 1$ Ans. C

15 A) $\frac{6}{5} \times \frac{1}{4} = \frac{3}{10}$ ✓ B) $\frac{6}{5} + \frac{1}{4} = \frac{29}{20}$ ×

C) $\frac{5}{6} \times \frac{4}{1} = \frac{10}{3}$ × D) $\frac{6}{5} - \frac{1}{20} = \frac{19}{20}$ ✓

Ans. A, D

16 Assertion: $\frac{3}{5} \times \frac{2}{2} = \frac{6}{10}$ (True) (10)

Reason: Conceptually (False)

Ans. C

17 Assertion: Conceptual (True)

Reason: Conceptual (True)

Ans: A

18 Statement I: $\frac{18}{15} - \frac{9}{7} = \frac{126-135}{105} = \frac{9}{105}$ not a fraction (False)

Ans: D

Statement II: Conceptual (True)

19 ~~$\frac{3}{4} + \frac{5}{11} = \frac{33+20}{44} = \frac{53}{44}$~~ (Cross)

$\frac{3+5}{4+11} = \frac{8}{15}$

19 $\frac{3}{4} = 0.75$ $\frac{5}{11} = 0.45$

0.45 ——— 0.75

A) $\frac{1}{2} = 0.5$ ✓

B) $\frac{8}{17} = 0.47$ ✓

C) 3 x

D) $\frac{13}{22} = 0.59$ ✓

Ans: A, B, D

20 Blue shirts people $= \frac{1}{4} \times 24 = 6$

Ans. 6

21 $\frac{t}{2} \times \frac{6}{5} = \frac{9}{5}$

$\Rightarrow t = 3$

Ans: 3

22 a) $\frac{29}{9} \times \frac{23}{6} = \frac{667}{24}$ (S)

b) $\frac{18^{2}}{5} \times \frac{8}{9_{1}} = \frac{144}{45} = \frac{16}{5}$ (R)

c) $\frac{135}{60} \times \frac{190}{11} = \frac{855}{22}$ (Q)

d) $\frac{1}{5} \times \frac{2}{1} = \frac{2}{5}$ (P)

Ans. S, R, Q, P

⟹ THE END ⟸