SUBJECT: MATHEMATICS　　　　　　　　　　　　**MAX. MARKS : 40**
CLASS : VII　　　　　　　　　　　　　　　　　**DURATION : 1½ hr**

SECTION – A
Questions 1 to 6 carry 1 mark each.

1. The standard form of -48/60 is
　　(a) 48/60　　　　　　(b) -60/48　　　　　(c) -4/5　　　　　(d) -4/-5
　　Ans: (c) -4/5
　　The standard form of -48/60 is = (-4/5)
　　Divide both numerator and denominator by 12 = -4/5

2. Find x such that $\dfrac{13}{6} = \dfrac{-65}{x}$
　　(a) –30　　(b) 30　　　　(c) –6　　　　　　(d) none of these
　　Ans: (a) –30

3. Find x such that $\dfrac{-3}{8}$ and $\dfrac{x}{-24}$ are equivalent rational numbers.
　　(a) 3　　(b) 9　　　　(c) 8　　　　　　(d) none of these
　　Ans: (b) 9

4. Fill in the boxes with the correct symbol: $\dfrac{-4}{5}$ ..... $\dfrac{-5}{7}$
　　(a) >　　(b) <　　　(c) =　　　　　　(d) none of these
　　Ans: (b) <

5. Write the next rational number in the pattern: $\dfrac{-3}{5}, \dfrac{-6}{10}, \dfrac{-9}{15}; \dfrac{-12}{20}, ...$
　　(a) $\dfrac{12}{25}$　　(b) $\dfrac{15}{25}$　　　　(c) $\dfrac{-15}{25}$　　　　　(d) none of these
　　Ans: (c) $\dfrac{-15}{25}$

6. Rewrite the rational number $\dfrac{44}{-72}$ in the simplest form.
　　(a) $\dfrac{22}{-36}$　　(b) $\dfrac{11}{-18}$　　　　(c) $\dfrac{11}{18}$　　　　　(d) none of these
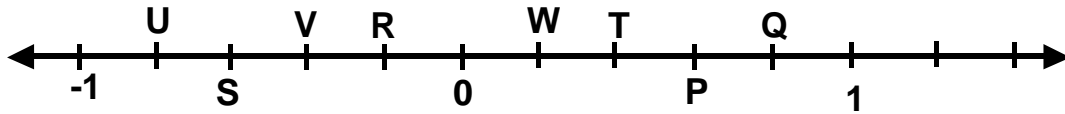　　Ans: (b) $\dfrac{11}{-18}$

SECTION – B(CCT Questions)
Questions 7 to 10 carry 1 mark each.

CCT Question
In Maths, a rational number is a type of real number, which is in the form of p/q where q is not equal to zero. Any fraction with non-zero denominators is a rational number.

Aditya is studying in Class VII and he was drawing the points P, Q, R, S, T, U and V on the number line such that, US = SV = VR, and WT = TP = PQ.

Answer the following questions based on the above information:

7. The rational number represented by Q

   (a) $\dfrac{3}{5}$ (b) $\dfrac{2}{5}$ (c) $\dfrac{4}{5}$ (d) none of these

   Ans: (c) $\dfrac{4}{5}$

8. The rational number represented by R

   (a) $\dfrac{-3}{5}$ (b) $\dfrac{-2}{5}$ (c) $\dfrac{-4}{5}$ (d) none of these

   Ans: (d) none of these

9. The rational number represented by S

   (a) $\dfrac{-3}{5}$ (b) $\dfrac{-2}{5}$ (c) $\dfrac{-4}{5}$ (d) none of these

   Ans: (a) $\dfrac{-3}{5}$

10. The rational number represented by T

    (a) $\dfrac{3}{5}$ (b) $\dfrac{2}{5}$ (c) $\dfrac{4}{5}$ (d) none of these

    Ans: (b) $\dfrac{2}{5}$

SECTION – C
Questions 11 to 13 carry 2 marks each.

11. Add $(i)\dfrac{7}{8}$ and $\dfrac{-5}{8}$ $(ii)\dfrac{4}{-5}$ and $\dfrac{3}{5}$

    Ans:

    (i) $\dfrac{7}{8}+\dfrac{-5}{8}=\dfrac{7+(-5)}{8}=\dfrac{2}{8}=\dfrac{1}{4}$.

    (ii) We first express $\dfrac{4}{-5}$ as a rational number with positive denominator,

    so $\dfrac{4}{-5}=\dfrac{4\times(-1)}{-5\times(-1)}=\dfrac{-4}{5}$

    ∴ $\dfrac{4}{-5}+\dfrac{3}{5}=\dfrac{-4}{5}+\dfrac{3}{5}=\dfrac{-4+3}{5}=\dfrac{-1}{5}$.

12. What should be added to $\dfrac{-7}{12}$ so as to get $\dfrac{9}{16}$?

    Ans: Sum of the given numbers = $\dfrac{9}{16}$

The given number $= \dfrac{-7}{12}$

$\therefore$ Required number = Sum - Given number

$= \dfrac{9}{16} - \left(-\dfrac{7}{12} \right) = \dfrac{9}{16} + \dfrac{7}{12} = \dfrac{9 \times 3 + 7 \times 4}{48} = \dfrac{27 + 28}{48} = \mathbf{\dfrac{55}{48}}.$

13. What number should be subtracted from $\dfrac{-7}{8}$ so as to get $\dfrac{5}{12}$?

Ans: Difference of the given numbers and the required number $= \dfrac{5}{12}$

The given number $= \dfrac{-7}{8}$

$\therefore$ Required number = Given number - Difference

$= \dfrac{-7}{8} - \dfrac{5}{12} = \dfrac{-7 \times 3 - 5 \times 2}{24} = \dfrac{-21 - 10}{24} = \mathbf{\dfrac{-31}{24}}.$

SECTION – D
Questions 14 to 17 carry 3 marks each.

14. Arrange the rational numbers $\dfrac{-3}{7}, \dfrac{5}{-14}, -\dfrac{7}{12}$ in ascending order.

Ans:

LCM of 7, 14 and 12 = 7 × 2 × 6 = 84.

$\dfrac{-3}{7} = \dfrac{-3 \times 12}{7 \times 12} = \dfrac{-36}{84}, \quad \dfrac{-5}{14} = \dfrac{-5 \times 6}{14 \times 6} = \dfrac{-30}{84}, \quad \dfrac{-7}{12} = \dfrac{-7 \times 7}{12 \times 7} = \dfrac{-49}{84}.$

Since, $-49 < -36 < -30$, therefore, $\dfrac{-49}{84} < \dfrac{-36}{84} < \dfrac{-30}{84}$

$\therefore \quad \dfrac{-7}{12} < \dfrac{-3}{7} < \dfrac{-5}{14}, i.e., -\dfrac{7}{12}, \dfrac{-3}{7}$ and $\dfrac{5}{-14}$ are in ascending order.

15. Subtract: $(i) \dfrac{7}{8}$ from $\dfrac{5}{12}$ $\quad (ii) \dfrac{-4}{9}$ from $\dfrac{-7}{18}$

Ans:

(i) $\dfrac{5}{12} - \dfrac{7}{8} = \dfrac{5}{12} + \dfrac{-7}{8}$

$= \dfrac{5 \times 2 + (-7) \times 3}{24} = \dfrac{10 - 21}{24} = \mathbf{\dfrac{-11}{24}}.$

(ii) $\dfrac{-7}{8} - \dfrac{-4}{9} = \dfrac{-7}{8} + \left(-\left(\dfrac{-4}{9} \right) \right)$

$= \dfrac{-7}{8} + \dfrac{4}{9} = \dfrac{-7 \times 9 + 4 \times 8}{72} = \dfrac{-63 + 32}{72} = \mathbf{\dfrac{-31}{72}}.$

16. Satpal walks $\dfrac{2}{3}$ km from a place P, towards east and then from there $1\dfrac{5}{7}$ km towards west.

Where will he be now from P?

Ans: Let the distance travelled towards east by positive sign.

So, the distances towards west would be denoted by negative sign.

Thus, distance of Satpal from the point P would be

$$\frac{2}{3}+\left(-1\frac{5}{7}\right)=\frac{2}{3}+\frac{(-12)}{7}=\frac{2\times7}{3\times7}+\frac{(-12)\times3}{7\times3}$$

$$=\frac{14-36}{21}=\frac{-22}{21}=-1\frac{1}{21}$$

Since it is negative, it means Satpal is at a distance $1\frac{1}{21}$ km towards west of P.

17. Simplify: $\dfrac{8}{-15}+\dfrac{7}{20}-\dfrac{-11}{35}+\dfrac{1}{5}$

Ans:

$$\frac{8}{-15}+\frac{7}{20}-\frac{-11}{35}+\frac{1}{5}=-\frac{8}{15}+\frac{7}{20}+\frac{11}{35}+\frac{1}{5}$$

$$=\frac{-8\times28+7\times21+11\times12+1\times84}{420}=\frac{-224+147+132+84}{420}$$

$$=\frac{-224+363}{420}=\frac{139}{420}.$$

SECTION – E
Questions 18 to 20 carry 4 marks each.

18. Simplify: $\left(\dfrac{-5}{9}\times\dfrac{72}{-125}\right)-\left(\dfrac{11}{17}\times\dfrac{34}{55}\right)+\left(\dfrac{28}{-13}\times\dfrac{-52}{21}\right)$

Ans:

$$\left(\frac{-5}{9}\times\frac{72}{-125}\right)-\left(\frac{11}{17}\times\frac{34}{55}\right)+\left(\frac{28}{-13}\times\frac{-52}{21}\right)$$

$$=\frac{\cancel{5}^1\times\cancel{72}^8}{\cancel{9}_1\times\cancel{125}_{25}}-\frac{\cancel{11}^1\times\cancel{34}^2}{\cancel{17}_1\times\cancel{55}_5}+\frac{\cancel{28}^4\times\cancel{52}^4}{\cancel{13}_1\times\cancel{21}_3}$$

$$=\frac{1\times8}{1\times25}-\frac{1\times2}{1\times5}+\frac{4\times4}{1\times3}=\frac{8}{25}-\frac{2}{5}+\frac{16}{3}$$

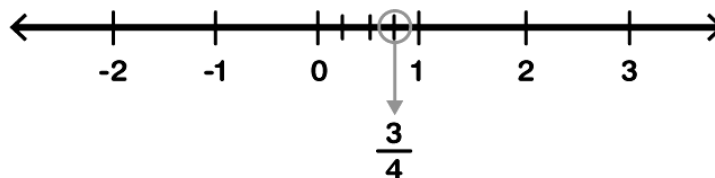$$=\frac{8\times3-2\times15+16\times25}{75}=\frac{24-30+400}{75}=\frac{424-30}{75}=\frac{394}{75}.$$

19. Draw the number line and represent the following rational numbers on it:

(i) $\dfrac{3}{4}$ (ii) $\dfrac{-5}{8}$
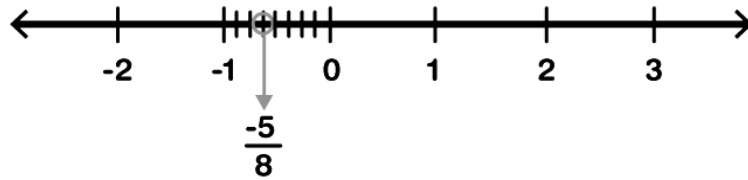
Ans: (i) We know that 3/4 is greater than 0 and less than 1.
∴ it lies between 0 and 1. It can be represented on the number line as,

(ii) We know that -5/8 is less than 0 and greater than -1.
∴ it lies between 0 and -1. It can be represented on the number line as,

A number line marked from -2 to 3 with an arrow pointing to $\dfrac{-5}{8}$.

20. Find: (i) $\dfrac{6}{25} \div \dfrac{3}{10}$ (ii) $\dfrac{-9}{44} \div \dfrac{3}{11}$

Ans:

(i) $\dfrac{6}{25} \div \dfrac{3}{10} = \dfrac{6}{25} \times \dfrac{10}{3} = \dfrac{2 \cancel{6} \times \cancel{10}^{\,2}}{{}_5\cancel{25} \times \cancel{3}_1} = \dfrac{2 \times 2}{5 \times 1} = \dfrac{4}{5}.$

(ii) $\dfrac{-9}{44} \div \dfrac{3}{11} = \dfrac{-9}{44} \times \dfrac{11}{3} = \dfrac{{}^3-\cancel{9} \times \cancel{11}^{\,1}}{{}_4\cancel{44} \times \cancel{3}_1} = \dfrac{-3 \times 1}{4 \times 1} = \dfrac{-3}{4}.$

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