

Fractions and Rational Numbers

Question Paper, Set 06

Time: 1 hour 30 minutes

Maximum marks: 50

Name: _____ Class: _____ Date: _____

1. Answer all 20 questions. The marks for each question are shown in brackets.
2. Show your working for the 2, 3 and 5 mark questions.
3. The key sheet and worked solutions are at the end of this paper.

1. A strip is divided into 11 equal parts and 2 of them are shaded. What fraction of the strip is not shaded? [1 mark]
2. Show that $\frac{19}{11}$ is a combination of a whole and a proper fraction. [2 marks]
3. From the fractions $\frac{8}{8}, \frac{1}{8}, \frac{13}{6}, \frac{1}{10}, \frac{4}{15}, \frac{7}{6}$, write the improper fractions. [1 mark]
4. Write $\frac{32}{9}$ as a mixed fraction. [2 marks]
5. Convert $22\frac{5}{7}$ into an improper fraction. [1 mark]
6. Are $\frac{19}{11}, \frac{14}{11}, \frac{15}{11}$ like or unlike fractions? Give the reason. [1 mark]
7. Write two equivalent fractions of $\frac{49}{70}$: one by dividing and one by multiplying the numerator and the denominator by the same number. [2 marks]
8. Write the standard form of: (i) $\frac{112}{88}$ (ii) $\frac{-8}{-24}$ (iii) $\frac{56}{-32}$ [3 marks]
9. Write in ascending order: 13, 20, -50, 15, -38, -23 [1 mark]
10. Arrange in ascending order: $\frac{15}{8}, \frac{1}{-8}, \frac{13}{12}, -\frac{3}{2}, -\frac{1}{3}$ [5 marks]
11. Using cross multiplication, check whether $\frac{21}{24}$ and $\frac{35}{40}$ are equal. [2 marks]
12. Find the value of $-\frac{73}{58} + \frac{32}{58} + \frac{52}{58} - \frac{58}{58}$. [2 marks]
13. Find $\frac{7}{9} - \frac{2}{3} + \frac{1}{6}$. [3 marks]
14. Simplify: $\frac{3}{10} + \frac{17}{14} - \frac{19}{20}$ [5 marks]
15. Find $\frac{13}{12} - 6$. [1 mark]
16. Find $-\frac{16}{15} \times \frac{9}{32} \times \frac{5}{12}$. [3 marks]
17. Simplify: $-\frac{63}{40} \times \frac{19}{132} \times \frac{55}{133}$ [5 marks]
18. Find $2\frac{1}{9} \times 2\frac{5}{8}$ and write the answer as a mixed fraction. [5 marks]
19. Find $2\frac{3}{10} \div 9$. [3 marks]

20. Represent $-\frac{7}{9}$ on the number line.

[2 marks]

Key sheet

Q	Answer
1	$\frac{9}{11}$
2	$\frac{19}{11} = 1 + \frac{8}{11}$
3	$\frac{8}{8}, \frac{13}{6}, \frac{7}{6}$
4	$3\frac{5}{9}$
5	$\frac{159}{7}$
6	Like fractions
7	$\frac{7}{10}, \frac{147}{210}$
8	(i) $\frac{14}{11}$ (ii) $\frac{1}{3}$ (iii) $-\frac{7}{4}$
9	$-50, -38, -23, 13, 15, 20$
10	$-\frac{3}{2}, -\frac{1}{3}, -\frac{1}{8}, \frac{13}{12}, \frac{15}{8}$
11	Equal: $\frac{21}{24} = \frac{35}{40}$
12	$-\frac{47}{58}$
13	$\frac{5}{18}$
14	$\frac{79}{140}$
15	$-\frac{59}{12}$
16	$-\frac{1}{8}$
17	$-\frac{3}{32}$
18	$\frac{133}{24} = 5\frac{13}{24}$
19	$\frac{23}{90}$
20	Divide -1 to 0 into 9 equal parts; $-\frac{7}{9}$ is the 7th point to the left of 0 .

Solutions

1. A strip is divided into 11 equal parts and 2 of them are shaded. What fraction of the strip is not shaded? [1]

$$\text{Unshaded parts} = 11 - 2 = 9$$

$$\text{Each part} = \frac{1}{11}$$

$$\text{Unshaded region} = \frac{9}{11}$$

Ans: $\frac{9}{11}$

2. Show that $\frac{19}{11}$ is a combination of a whole and a proper fraction. [2]

$$\frac{19}{11} = \frac{11+8}{11}$$

$$= \frac{11}{11} + \frac{8}{11}$$

$$= 1 + \frac{8}{11}$$

Ans: $\frac{19}{11} = 1 + \frac{8}{11}$

3. From the fractions $\frac{8}{8}$, $\frac{1}{8}$, $\frac{13}{6}$, $\frac{1}{10}$, $\frac{4}{15}$, $\frac{7}{6}$, write the improper fractions. [1]

Improper fraction: numerator $\geq$ denominator.

$$8 = 8, 13 > 6, 7 > 6$$

Improper fractions: $\frac{8}{8}$, $\frac{13}{6}$, $\frac{7}{6}$

Ans: $\frac{8}{8}$, $\frac{13}{6}$, $\frac{7}{6}$

4. Write $\frac{32}{9}$ as a mixed fraction. [2]

$$\text{Divide 32 by 9: } 9 \times 3 = 27, 32 - 27 = 5$$

$$\text{Quotient} = 3, \text{ remainder} = 5$$

$$\therefore \frac{32}{9} = 3 + \frac{5}{9} = 3\frac{5}{9}$$

Ans: $3\frac{5}{9}$

5. Convert $22\frac{5}{7}$ into an improper fraction. [1]

$$22\frac{5}{7} = \frac{(22 \times 7) + 5}{7}$$

$$= \frac{154+5}{7} = \frac{159}{7}$$

Ans: $\frac{159}{7}$

6. Are $\frac{19}{11}$, $\frac{14}{11}$, $\frac{15}{11}$ like or unlike fractions? Give the reason. [1]

Denominators: 11, 11, 11

They are the same, so these are like fractions.

Ans: Like fractions

7. Write two equivalent fractions of $\frac{49}{70}$: one by dividing and one by multiplying the numerator and the denominator by the same number. [2]

$$\frac{49}{70} = \frac{49 \div 7}{70 \div 7} = \frac{7}{10}$$

$$\frac{49}{70} = \frac{49 \times 3}{70 \times 3} = \frac{147}{210}$$

Ans: $\frac{7}{10}$, $\frac{147}{210}$

8. Write the standard form of: (i) $\frac{112}{88}$ (ii) $\frac{-8}{-24}$ (iii) $\frac{56}{-32}$ [3]

(i) $\frac{112}{88}$

H.C.F of 112, 88 = 8; $\frac{112 \div 8}{88 \div 8} = \frac{14}{11}$

(ii) $\frac{-8}{-24} = \frac{8}{24}$, since $(-)/(-) = (+)$

H.C.F of 8, 24 = 8; $\frac{8 \div 8}{24 \div 8} = \frac{1}{3}$

(iii) $\frac{56}{-32} = -\frac{56}{32}$, since $(+)/(-) = (-)$

H.C.F of 56, 32 = 8; $-\frac{56 \div 8}{32 \div 8} = -\frac{7}{4}$

Ans: (i) $\frac{14}{11}$ (ii) $\frac{1}{3}$ (iii) $-\frac{7}{4}$

9. Write in ascending order: 13, 20, -50, 15, -38, -23 [1]

Every negative number is less than 0 and less than every positive number.

Among negative numbers, the bigger the number after the minus sign, the smaller it is: $-50 < -38 < -23$

Ascending order: -50, -38, -23, 13, 15, 20

Ans: -50, -38, -23, 13, 15, 20

10. Arrange in ascending order: $\frac{15}{8}$, $\frac{1}{-8}$, $\frac{13}{12}$, $-\frac{3}{2}$, $-\frac{1}{3}$ [5]

$\frac{1}{-8} = -\frac{1}{8}$, since $(+)/(-) = (-)$

L.C.M of 8, 12, 2, 3 = $2 \times 2 \times 3 \times 2 = 24$

$\frac{15}{8} = \frac{15 \times 3}{8 \times 3} = \frac{45}{24}$

$-\frac{1}{8} = \frac{-1 \times 3}{8 \times 3} = -\frac{3}{24}$

$\frac{13}{12} = \frac{13 \times 2}{12 \times 2} = \frac{26}{24}$

$-\frac{3}{2} = \frac{-3 \times 12}{2 \times 12} = -\frac{36}{24}$

$-\frac{1}{3} = \frac{-1 \times 8}{3 \times 8} = -\frac{8}{24}$

Comparing numerators: $-\frac{36}{24} < -\frac{8}{24} < -\frac{3}{24} < \frac{26}{24} < \frac{45}{24}$

$\Rightarrow -\frac{3}{2} < -\frac{1}{3} < -\frac{1}{8} < \frac{13}{12} < \frac{15}{8}$

Ans: $-\frac{3}{2}$, $-\frac{1}{3}$, $-\frac{1}{8}$, $\frac{13}{12}$, $\frac{15}{8}$

11. Using cross multiplication, check whether $\frac{21}{24}$ and $\frac{35}{40}$ are equal. [2]

$21 \times 40 = 840$ and $24 \times 35 = 840$

$840 = 840 \Rightarrow \frac{21}{24} = \frac{35}{40}$

Ans: Equal: $\frac{21}{24} = \frac{35}{40}$

12. Find the value of $-\frac{73}{58} + \frac{32}{58} + \frac{52}{58} - \frac{58}{58}$. [2]

$= \frac{-73+32+52-58}{58}$

$= \frac{84-131}{58}$

$= -\frac{47}{58}$

Ans: $-\frac{47}{58}$

13. Find $\frac{7}{9} - \frac{2}{3} + \frac{1}{6}$. [3]

L.C.M of 9, 3, 6 = $3 \times 3 \times 2 = 18$

$$= \frac{14-12+3}{18}$$

$$= \frac{17-12}{18}$$

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

Ans: $\frac{5}{18}$

14. Simplify: $\frac{3}{10} + \frac{17}{14} - \frac{19}{20}$ [5]

L.C.M of 10, 14, 20 = $2 \times 5 \times 7 \times 2 = 140$

$$\frac{3}{10} = \frac{3 \times 14}{10 \times 14} = \frac{42}{140}$$

$$\frac{17}{14} = \frac{17 \times 10}{14 \times 10} = \frac{170}{140}$$

$$-\frac{19}{20} = \frac{-19 \times 7}{20 \times 7} = -\frac{133}{140}$$

$$= \frac{42+170-133}{140}$$

$$= \frac{212-133}{140}$$

$$= \frac{79}{140}$$

Ans: $\frac{79}{140}$

15. Find $\frac{13}{12} - 6$. [1]

$$= \frac{13}{12} - \frac{6}{1}$$

$$= \frac{13-72}{12}$$

$$= -\frac{59}{12}$$

Ans: $-\frac{59}{12}$

16. Find $-\frac{16}{15} \times \frac{9}{32} \times \frac{5}{12}$. [3]

Sign: $(-) \times (+) \times (+) = (-)$

$$= -\frac{16 \times 9 \times 5}{15 \times 32 \times 12}$$

$$= -\frac{(2 \times 2 \times 2 \times 2) \times (3 \times 3) \times 5}{(3 \times 5) \times (2 \times 2 \times 2 \times 2 \times 2) \times (2 \times 2 \times 3)}$$

Cancelling the common factors 2, 2, 2, 2, 3, 3, 5: $= -\frac{1}{2 \times 2 \times 2} = -\frac{1}{8}$

Ans: $-\frac{1}{8}$

17. Simplify: $-\frac{63}{40} \times \frac{19}{132} \times \frac{55}{133}$ [5]

Sign: $(-) \times (+) \times (+) = (-)$

$$= -\frac{63 \times 19 \times 55}{40 \times 132 \times 133}$$

$$= -\frac{(3 \times 3 \times 7) \times 19 \times (5 \times 11)}{(2 \times 2 \times 2 \times 5) \times (2 \times 2 \times 3 \times 11) \times (7 \times 19)}$$

Cancelling the common factors 3, 5, 7, 11, 19: $= -\frac{3}{2 \times 2 \times 2 \times 2 \times 2} = -\frac{3}{32}$

Ans: $-\frac{3}{32}$

18. Find $2\frac{1}{9} \times 2\frac{5}{8}$ and write the answer as a mixed fraction. [5]

$$2\frac{1}{9} = \frac{(2 \times 9) + 1}{9} = \frac{19}{9}$$

$$2\frac{5}{8} = \frac{(2 \times 8) + 5}{8} = \frac{21}{8}$$

$$2\frac{1}{9} \times 2\frac{5}{8} = \frac{19}{9} \times \frac{21}{8} = \frac{19 \times 21}{9 \times 8}$$

$$\text{Cancelling common factors:} = \frac{133}{24}$$

$$133 \div 24: \text{quotient } 5, \text{ remainder } 13; = 5\frac{13}{24}$$

$$\text{Ans: } \frac{133}{24} = 5\frac{13}{24}$$

19. Find $2\frac{3}{10} \div 9$. [3]

$$2\frac{3}{10} = \frac{(2 \times 10) + 3}{10} = \frac{23}{10}$$

$$2\frac{3}{10} \div 9 = \frac{23}{10} \div \frac{9}{1} = \frac{23}{10} \times \frac{1}{9}$$

$$= \frac{23}{10 \times 9} = \frac{23}{90}$$

$$\text{Ans: } \frac{23}{90}$$

20. Represent $-\frac{7}{9}$ on the number line. [2]

$$\text{Each part} = \frac{1}{9}; -1 = -\frac{9}{9}.$$

$$\text{Points to the left of 0: } -\frac{1}{9}, -\frac{2}{9}, -\frac{3}{9}, -\frac{4}{9}, \dots$$

$$\text{Count 7 parts to the left of 0 and mark } -\frac{7}{9}.$$

$$\text{Ans: Divide } -1 \text{ to } 0 \text{ into } 9 \text{ equal parts; } -\frac{7}{9} \text{ is the 7th point to the left of 0.}$$
