Class 6

Chapter 6 fractions

Exercise 6.1

Exercise 6.1 — Fractions (Questions 1–23)
Step-by-step, student-friendly solutions with colour highlights. Methods are shown in brown; final answers are in green.

Quick Rules (recall)
• Equivalent fractions: multiply/divide numerator and denominator by same number.
• Cross-multiplication: if a/b = c/d then a×d = b×c (use to find missing numbers).
• Reduce fractions by dividing numerator & denominator by their GCF.
• Compare fractions using cross-multiplication: compare a×d and c×b.
• Improper → mixed: divide numerator by denominator. Mixed → improper: W r/s = (W×s + r)/s.

1. Write the next two equivalent fractions
Method: Equivalent fractions are obtained by multiplying numerator and denominator by the same number; or follow the pattern shown.
(i) 1/2 = 2/4 = 3/6 = ? = ?
Explanation: You can multiply 1/2 by 4 to get 4/8, and by 5 to get 5/10. Or see the pattern: numerators 1,2,3 → next 4,5; denominators 2,4,6 → next 8,10.
Answer: 4/8, 5/10

(ii) 2/3 = 4/6 = 6/9 = ? = ?
Explanation: Multiply both parts by 4 and 5 respectively: 2/3×4/4 = 8/12, 2/3×5/5 = 10/15.
Answer: 8/12, 10/15

(iii) 3/7 = 6/14 = 9/21 = ? = ?
Explanation: Multiply by 4 and 5: 3/7×4/4 = 12/28, ×5/5 = 15/35.
Answer: 12/28, 15/35

(iv) 2/9 = 4/18 = 6/27 = ? = ?
Explanation: Multiply by 4 and 5: 2/9×4/4 = 8/36, ×5/5 = 10/45.
Answer: 8/36, 10/45

2. Find the missing numerals (use cross-multiplication)
Method: If a/b = c/d and one number is missing, use a×d = b×c to solve for the missing number. Or simplify the known fraction and match forms.
(a) 2/3 = 14/x
Compute: 2×x = 3×14 = 42 → x = 21.
Answer: x = 21

(b) 5/7 = x/56
Compute: To get denominator 56 from 7 we multiplied by 8, so multiply numerator 5 by 8 → x = 40.
Answer: x = 40

(c) 7/9 = 35/x
Compute: 7×5 = 35 so multiplier = 5 → x = 9×5 = 45.
Answer: x = 45

(d) 5/? = 40/56
Compute: Simplify 40/56 by dividing both by 8 → 5/7. So missing denominator = 7.
Answer: denominator = 7

(e) 3/? = 27/45
Compute: Simplify 27/45 divide by 9 → 3/5. So denominator = 5.
Answer: denominator = 5

(f) ?/3 = 14/21
Compute: Simplify 14/21 divide by 7 → 2/3. So missing numerator = 2.
Answer: numerator = 2

3. Are the two fractions equivalent? (show reason)
Method: Multiply numerator & denominator of one fraction by the same number and check equality; or simplify both and compare.
(i) 7/9 and 21/27
7/9 × 3/3 = 21/27 → They are equivalent.
Answer: Yes (Equivalent)

(ii) 3/2 and 6/9
3/2 = 1.5, 6/9 = 2/3 ≈ 0.666 → Not equal.
Answer: No (Not equivalent)

(iii) 2/5 and 8/20
2/5 × 4/4 = 8/20 → Equivalent.
Answer: Yes (Equivalent)

(iv) 2/3 and 3/4
2/3 ≈ 0.666, 3/4 = 0.75 → Not equal.
Answer: No (Not equivalent)

4. Answer in True or False (with short reason)
(i) 5/3 = 10/4 ?
5/3 ≈ 1.666, 10/4 = 2.5 → Not equal.
Answer: False

(ii) 7/5 = 21/15 ?
Multiply 7/5 by 3/3 → 21/15 → equal.
Answer: True

(iii) 2/7 = 20/70 ?
Multiply 2/7 by 10/10 → 20/70 → equal.
Answer: True

(iv) 9/11 = 72/80 ?
9/11 ≈ 0.818, 72/80 = 0.9 → Not equal.

Answer: False

5. Reduce into the lowest terms (divide by GCF)
(i) 35/45
GCF(35,45) = 5 → divide both by 5: 35÷5 / 45÷5 = 7/9.
Answer: 7/9

(ii) 56/40
GCF = 8 → 56÷8 / 40÷8 = 7/5.
Answer: 7/5

(iii) 18/63
GCF = 9 → 18÷9 / 63÷9 = 2/7.
Answer: 2/7

(iv) 30/45
GCF = 15 → 30÷15 / 45÷15 = 2/3.
Answer: 2/3

(v) 45/18
GCF = 9 → 45÷9 / 18÷9 = 5/2.
Answer: 5/2

(vi) 45/60
GCF = 15 → 45÷15 / 60÷15 = 3/4.
Answer: 3/4

6. Simplify (divide by GCF and reduce)
(i) 45/60 = divide by 15 → 3/4.
Answer: 3/4

(ii) 125/500 = divide by 125 → 1/4.
Answer: 1/4

(iii) 25/30 = divide by 5 → 5/6.
Answer: 5/6

(iv) 18/45 = divide by 9 → 2/5.
Answer: 2/5

(v) 15/75 = divide by 15 → 1/5.
Answer: 1/5

(vi) 12/20 = divide by 4 → 3/5.
Answer: 3/5

7. Which are proper fractions? (numerator < denominator)
Method: A proper fraction has numerator smaller than denominator. Check each given fraction on the page and mark those with numerator < denominator.
Examples (from the page):

2/9 → proper; 7/11 → proper; 7/3 → improper; 8/7 → improper; 3/7 → proper; 11/4 → improper; 8/11 → proper; 15/4 → improper.
Answer: Proper fractions are 2/9, 7/11, 3/7, 8/11 (others shown are improper)

8. Which are improper fractions? (numerator ≥ denominator)
Method: If numerator ≥ denominator, it is improper. From the page examples:
15/7 → improper; 20/11 → improper; 21/16 → improper; 23/4 → improper; 8/7 → improper. (Any fraction with numerator ≥ denominator is improper.)
Answer: Examples: 15/7, 20/11, 21/16, 23/4, 8/7

9. Which are mixed-numbers?
Method: Mixed numbers have a whole number plus a proper fraction (e.g., 1 1/2). Check items on the page and mark those written in mixed form.
Examples from the page: 1 1/2, 3 7/9, 14/3 is NOT mixed (it's improper), 5 7/11, 3 1/8, 1 1/11, 11/15 is simple fraction.
Answer: Mixed numbers seen: 1 1/2, 3 7/9, 5 7/11, 3 1/8 (as given on page). If you want the exact list printed on your book, I can match them precisely if you send a clearer crop.

10. Write each of the following fractions as mixed-numbers (improper → mixed)
(i) 11/4 → divide 11 by 4: quotient 2 remainder 3 → 2 3/4.
Answer: 2 3/4

(ii) 40/6 → 40 ÷ 6 = 6 remainder 4 → 6 4/6 = 6 2/3 (simplify).
Answer: 6 2/3

(iii) 20/15 → 20 ÷ 15 = 1 remainder 5 → 1 5/15 = 1 1/3.
Answer: 1 1/3

(iv) 25/7 → 25 ÷ 7 = 3 remainder 4 → 3 4/7.
Answer: 3 4/7

(v) 18/7 → 18 ÷ 7 = 2 remainder 4 → 2 4/7.
Answer: 2 4/7

(vi) 81/10 → 81 ÷ 10 = 8 remainder 1 → 8 1/10.
Answer: 8 1/10

(vii) 145/9 → 145 ÷ 9 = 16 remainder 1 → 16 1/9.
Answer: 16 1/9

(viii) 150/7 → 150 ÷ 7 = 21 remainder 3 → 21 3/7.
Answer: 21 3/7

11. Convert each mixed-number into improper fractions
(i) 1 4/7 → (1×7 + 4)/7 = 11/7. Answer: 11/7
(ii) 7 2/3 → (7×3 + 2)/3 = 23/3. Answer: 23/3
(iii) 11 8/9 → (11×9 + 8)/9 = 107/9. Answer: 107/9
(iv) 7 3/4 → (7×4 + 3)/4 = 31/4. Answer: 31/4
(v) 8 3/4 → (8×4 + 3)/4 = 35/4. Answer: 35/4
(vi) 4 11/23 → (4×23 +11)/23 = 103/23. Answer: 103/23

(vii) 21 21/22 → (21×22 +21)/22 = 483/22. Answer: 483/22

12. Shade 5/8 portion of the adjoining figure
Method: If the figure is divided into 8 equal parts, shade any 5 of them. That's 5/8 of the whole.

Answer: Shade 5 out of 8 equal parts → 5/8

13. Shade 3/11 portion of the adjoining figure
Method: If the figure has 11 equal parts, shade any 3. That's 3/11 of the whole.

Answer: Shade 3 out of 11 equal parts → 3/11

14. In the following figures what part is shaded?
(i) Circle with 1 of 4 parts shaded → 1/4. (ii) Circle with 3 of 8 parts shaded → 3/8.
(iii) Row of 10 squares with 3 shaded → 3/10. (iv) Rectangle of 12 small squares with 5 shaded → 5/12.
Answers: (i) 1/4, (ii) 3/8, (iii) 3/10, (iv) 5/12

15. Compare using >, < or = (use cross-multiplication)
Method: For a/b and c/d compute a×d and c×b. If a×d > c×b then a/b > c/d, etc.
Example comparisons (worked step-by-step):
3/5 > 20/35 (because 3×35 = 105 and 20×5 = 100)
1/2 < 7/6 (because 1×6 = 6 and 7×2 = 14)
5/7 > 2/5 (because 5×5 = 25 and 2×7 = 14)
5/12 < 1/2 (because 5×2 = 10 and 1×12 = 12)
1/4 < 7/20 (because 1×20 = 20 and 7×4 = 28)
5/12 > 1/3 (because 5×3 = 15 and 1×12 = 12)
1/2 < 5/2 (because 1×2 = 2 and 5×2 = 10)
3/12 < 14/12 (because 3×12 = 36 and 14×12 = 168)

16. Which are true? (use cross-multiplication)
Examples:
Is 3/7 > 1/5? True (because 3×5 = 15 and 1×7 = 7)
Is 10/15 > 3/4? False (because 10×4 = 40 and 3×15 = 45)
Is 19/7 > 2 3/5? True (because 19×5 = 95 and 13×7 = 91)
Is 5/7 > 5/8? True (because 5×8 = 40 and 5×7 = 35)

17. Write as a fraction
Rule: a ÷ b = a/b. Example: 17 ÷ 21 = 17/21.
Answer: a ÷ b = a/b (example: 17 ÷ 21 = 17/21)

18. Write as division sum
Rule: Fraction p/q = p ÷ q. Example: 5/11 = 5 ÷ 11.
Answer: 5/11 = 5 ÷ 11

19. Write an equivalent fraction of:
(i) 7/9 with numerator 35 → multiply top & bottom by 5 → 35/45.
Answer: 35/45

(ii) 3/7 with denominator 35 → multiply by 5 → 15/35.

Answer: 15/35

(iii) 5/11 with denominator 77 → multiply by 7 → 35/77.
Answer: 35/77

20. Convert each set of unlike fractions into like fractions
(i) 1/3, 2/9, 7/9, 11/27 → LCM = 27. Convert: 1/3 = 9/27; 2/9 = 6/27; 7/9 = 21/27; 11/27 = 11/27.
Answer: 9/27, 6/27, 21/27, 11/27

(ii) 3/5, 7/10, 1/15, 3/20 → LCM = 60. Convert: 3/5=36/60; 7/10=42/60; 1/15=4/60; 3/20=9/60.
Answer: 36/60, 42/60, 4/60, 9/60

Question 21
Arrange the following fractions in increasing order:
(1/2, 3/2, 1/5, 2/7, 1/14)
Step 1: Find LCM of denominators.
Denominators are 2, 2, 5, 7, 14.
LCM = 70.
Step 2: Convert each fraction to denominator 70:
1/2 = 35/70, 3/2 = 105/70, 1/5 = 14/70, 2/7 = 20/70, 1/14 = 5/70.
Step 3: Arrange by numerators (increasing):
5, 14, 20, 35, 105
✓ Increasing order: 1/14, 1/5, 2/7, 1/2, 3/2

Question 22
Arrange the following fractions in decreasing order:
(5/14, 5/7, 3/4, 1/20, 3/14)
Step 1: Find LCM of denominators.
Denominators: 14, 7, 4, 20 → LCM = 140.
Step 2: Convert each fraction to denominator 140:
5/14 = 50/140, 5/7 = 100/140, 3/4 = 105/140, 1/20 = 7/140, 3/14 = 30/140.
Step 3: Arrange by numerators (decreasing):
105, 100, 50, 30, 7
✓ Decreasing order: 3/4, 5/7, 5/14, 3/14, 1/20

Question 23
Arrange the following fractions in increasing order:
(1/5, 2/15, 3/20, 7/10, 11/15)
Step 1: Find LCM of denominators.
Denominators: 5, 15, 20, 10 → LCM = 60.
Step 2: Convert each fraction to denominator 60:
1/5 = 12/60, 2/15 = 8/60, 3/20 = 9/60, 7/10 = 42/60, 11/15 = 44/60.
Step 3: Arrange by numerators (increasing):
8, 9, 12, 42, 44
✓ Increasing order: 2/15, 3/20, 1/5, 7/10, 11/15

Final Answers Summary

Q.No	Order Type	Fractions
21	Increasing	1/14, 1/5, 2/7, 1/2, 3/2

22	Decreasing	3/4, 5/7, 5/14, 3/14, 1/20
23	Increasing	2/15, 3/20, 1/5, 7/10, 11/15

Exercise 6.2

Addition and Subtraction of Fractions (Class 6)

Complete, student-friendly step-by-step solutions with colour highlights.

Useful Methods (Quick reminder)

- To add or subtract fractions, first make denominators the same (use LCM).
- For mixed numbers: convert to improper fractions, operate, then convert back.
- To compare or simplify, use GCF to reduce.

1. Find the sum

1(i) 5/7 + 3/14

Step 1: LCM of 7 and 14 = 14.
Convert: 5/7 = 10/14. So 10/14 + 3/14 = 13/14.
Answer: 13/14

1(ii) 5/8 + 7/16

LCM of 8 and 16 = 16. Convert: 5/8 = 10/16. So 10/16 + 7/16 = 17/16 = 1 1/16.
Answer: 17/16 = 1 1/16

1(iii) 9 + 8/11

Treat 9 as 9 + 0: sum = 9 8/11 (already a mixed number). Answer: 9 8/11

1(iv) 2 3/5 + 3 1/4

Convert to improper: 2 3/5 = (2×5+3)/5 = 13/5. 3 1/4 = 13/4.
LCM of 5 and 4 = 20. Convert: 13/5 = 52/20, 13/4 = 65/20.
Sum = 52/20 + 65/20 = 117/20 = 5 17/20.
Answer: 5 17/20

1(v) 7 2/5 + 4 2/3

7 2/5 = (7×5+2)/5 = 37/5. 4 2/3 = 14/3.
LCM of 5 and 3 = 15. Convert: 37/5 = 111/15, 14/3 = 70/15.
Sum = 111/15 + 70/15 = 181/15 = 12 1/15.
Answer: 12 1/15

1(vi) 7 3/5 + 2 1/6

7 3/5 = 38/5. 2 1/6 = 13/6.
LCM of 5 and 6 = 30. Convert: 38/5 = 228/30, 13/6 = 65/30.
Sum = 228/30 + 65/30 = 293/30 = 9 23/30.
Answer: 9 23/30

2. Find the sum (three fractions)

2(i) 4/3 + 1/5 + 3/4

LCM of 3,5,4 = 60. Convert: 4/3 = 80/60, 1/5 = 12/60, 3/4 = 45/60.
Sum = 80+12+45 = 137/60 = 2 17/60.
Answer: 2 17/60

2(ii) 4/3 + 1/5 + 3/4

(This part on the book repeats the same expression.) Answer: 2 17/60 (same as above)

2(iii) 2/9 + 1/3 + 4/15

LCM of 9,3,15 = 45. Convert: 2/9 = 10/45, 1/3 = 15/45, 4/15 = 12/45.
Sum = 10+15+12 = 37/45. Answer: 37/45

2(iv) 4/7 + 1/14 + 11/21

LCM 42. Convert: 4/7 = 24/42, 1/14 = 3/42, 11/21 = 22/42.
Sum = 24+3+22 = 49/42 = 1 7/42 = 1 1/6. Answer: 1 1/6

2(v) 6/11 + 2/3 + 5/22

LCM 66. Convert: 6/11 = 36/66, 2/3 = 44/66, 5/22 = 15/66.
Sum = 36+44+15 = 95/66 = 1 29/66. Answer: 1 29/66

2(vi) 2/7 + 3/5 + 3/4

LCM 140. Convert: 2/7=40/140, 3/5=84/140, 3/4=105/140.
Sum = 40+84+105 = 229/140 = 1 89/140. Answer: 1 89/140

3. Add (mixed expressions)

3(i) 2 1/5 + 7 3/4

Convert: 2 1/5 = 11/5. 7 3/4 = 31/4.
LCM 20: 11/5 = 44/20, 31/4 = 155/20.
Sum = 199/20 = 9 19/20. Answer: 9 19/20

3(ii) 4/7 + 3 1/5 + 2 5/14

Convert: 3 1/5 = 16/5, 2 5/14 = 33/14.
LCM of 7,5,14 = 70. Convert: 4/7 = 40/70, 16/5 = 224/70, 33/14 = 165/70.
Sum = 40+224+165 = 429/70 = 6 9/70. Answer: 6 9/70

3(iii) 7 3/4 + 1 1/5 + 5/15

Convert: 7 3/4 = 31/4, 1 1/5 = 6/5, 5/15 = 1/3.
LCM 60: 31/4 = 465/60, 6/5 = 72/60, 1/3 = 20/60.
Sum = 465+72+20 = 557/60 = 9 17/60. Answer: 9 17/60

3(iv) 5 1/7 + 2 1/3 + 5 1/4

Convert: 5 1/7 = 36/7, 2 1/3 = 7/3, 5 1/4 = 21/4.
LCM 84: 36/7 = 432/84, 7/3 = 196/84, 21/4 = 441/84.
Sum = 432+196+441 = 1069/84 = 12 61/84. Answer: 12 61/84

4. Find the difference (simple fractions)

4(i) 7/9 − 1/8

LCM 72: 7/9 = 56/72, 1/8 = 9/72. Difference = 56−9 = 47/72. Answer: 47/72

4(ii) 5/7 − 2/3

LCM 21: 5/7 = 15/21, 2/3 = 14/21. Difference = 1/21. Answer: 1/21

4(iii) 5/11 − 2/13

LCM 143: 5/11 = 65/143, 2/13 = 22/143. Difference = 43/143. Answer: 43/143

4(iv) 1/9 − 2/21

LCM 63: 1/9 = 7/63, 2/21 = 6/63. Difference = 1/63. Answer: 1/63

4(v) 1/11 − 1/12

LCM 132: 1/11 = 12/132, 1/12 = 11/132. Difference = 1/132. Answer: 1/132

4(vi) 3/5 − 1/7

LCM 35: 3/5 = 21/35, 1/7 = 5/35. Difference = 16/35. Answer: 16/35

5. Find the difference (mixed numbers)

5(i) 7 3/5 − 2 1/8

Convert: 7 3/5 = 38/5, 2 1/8 = 17/8. LCM 40: 38/5 = 304/40, 17/8 = 85/40.
Difference = 304−85 = 219/40 = 5 19/40. Answer: 5 19/40

5(ii) 5 2/5 − 3 2/8

5 2/5 = 27/5, 3 2/8 = 26/8 = 13/4. LCM 20: 27/5 = 108/20, 13/4 = 65/20.
Difference = 108−65 = 43/20 = 2 3/20. Answer: 2 3/20

5(iii) 2 1/3 − 1 1/2

2 1/3 = 7/3, 1 1/2 = 3/2. LCM 6: 7/3 = 14/6, 3/2 = 9/6.
Difference = 14−9 = 5/6. Answer: 5/6

5(iv) 13 4/7 − 6

13 4/7 = 95/7. 6 = 42/7. Difference = 95−42 = 53/7 = 7 4/7. Answer: 7 4/7

5(v) 9 − 5/7

9 = 63/7. Difference = 63/7 − 5/7 = 58/7 = 8 2/7. Answer: 8 2/7

5(vi) 7 − 3 4/11

3 4/11 = 37/11. 7 = 77/11. Difference = 77−37 = 40/11 = 3 7/11. Answer: 3 7/11

6. Simplify (mix of + and −)

6(i) 2/3 + 1/4 − 1/5

LCM 60: 2/3 = 40/60, 1/4 = 15/60, 1/5 = 12/60.
Result = 40+15−12 = 43/60. Answer: 43/60

6(ii) 3/7 − 1/4 + 5/6

LCM 84: 3/7 = 36/84, 1/4 = 21/84, 5/6 = 70/84.
Result = 36−21+70 = 85/84 = 1 1/84. Answer: 1 1/84

6(iii) 3/8 + 1/9 − 1/4

LCM 72: 3/8 = 27/72, 1/9 = 8/72, 1/4 = 18/72.
Result = 27+8−18 = 17/72. Answer: 17/72

6(iv) 3/5 + 7/9 − 1/3

LCM 45: 3/5 = 27/45, 7/9 = 35/45, 1/3 = 15/45.
Result = 27+35−15 = 47/45 = 1 2/45. Answer: 1 2/45

7. Simplify (longer mixed expressions)

7(i) 4 2/3 + 1 1/4 − 2 2/3

Convert: 4 2/3 = 14/3, 1 1/4 = 5/4, 2 2/3 = 8/3.
14/3 − 8/3 = 6/3 = 2. Then 2 + 5/4 = 2 + 1 1/4 = 3 1/4. Answer: 3 1/4

7(ii) 3 1/5 + 4 2/3 − 3 1/4

Convert: 3 1/5 = 16/5, 4 2/3 = 14/3, 3 1/4 = 13/4.
LCM 60: 16/5 = 192/60, 14/3 = 280/60, 13/4 = 195/60.
Result = 192+280−195 = 277/60 = 4 37/60. Answer: 4 37/60

7(iii) 5 1/7 − 1 2/3 + 1 5/7

Convert: 5 1/7 = 36/7, 1 2/3 = 5/3, 1 5/7 = 12/7.
Combine: (36+12)/7 − 5/3 = 48/7 − 5/3.
LCM 21: 48/7 = 144/21, 5/3 = 35/21. Difference = 109/21 = 5 4/21. Answer: 5 4/21

7(iv) 2 1/3 + 5 1/4 − 3 1/5

Convert: 2 1/3 = 7/3, 5 1/4 = 21/4, 3 1/5 = 16/5.
LCM 60: 7/3 = 140/60, 21/4 = 315/60, 16/5 = 192/60.
Result = 140+315−192 = 263/60 = 4 23/60. Answer: 4 23/60

8. Find 1/3 less than 9 1/2

Compute: 9 1/2 − 1/3. 9 1/2 = 19/2. LCM 6: 19/2 = 57/6, 1/3 = 2/6.
Difference = 57−2 = 55/6 = 9 1/6. Answer: 9 1/6

9. Find 1 4/5 less than 4 3/5

Compute: 4 3/5 − 1 4/5. 4 3/5 = 23/5, 1 4/5 = 9/5.
Difference = 23/5 − 9/5 = 14/5 = 2 4/5. Answer: 2 4/5

10. What is to be added to 4 1/5 to get 5 1/7?

Let x + 4 1/5 = 5 1/7 → x = 5 1/7 − 4 1/5.
5 1/7 = 36/7. 4 1/5 = 21/5. LCM 35: 36/7 = 180/35, 21/5 = 147/35.

Difference = 180−147 = 33/35. Answer: 33/35

11. What is to be subtracted from 3 to get 1 1/2?

3 − x = 1 1/2 → x = 3 − 1 1/2 = 1 1/2 = 3/2. Answer: 3/2

12. Fill in the blanks

12(i) 7/5 + ___ = 7/5. Blank = 0 (because adding 0 does not change the value).

12(ii) 5/7 + 3/8 = 3/8 + ___ . Blank = 5/7 (commutative property).

12(iii) 5/9 − 5/9 = ___. Blank = 0.

12(iv) 7 3/4 − 7 3/4 = ___. Blank = 0.

Exercise 6.3

Multiplication of Fractions (Complete)

1. Multiply:

(i) 4/5 × 3/7

Step 1: Write the fractions → 4/5 × 3/7

Step 2: Multiply numerators: 4 × 3 = 12

Step 3: Multiply denominators: 5 × 7 = 35

Answer: 12/35 (in simplest form)

(ii) 7/9 × 3/5

7/9 × 3/5 = (7×3)/(9×5) = 21/45. Simplify: ÷3 → 7/15

(iii) 11/12 × 6/7

11/12 × 6/7 = 66/84. Simplify: ÷6 → 11/14

(iv) 3/7 × 28/27

Cancel: 3 and 27 → 1 and 9; 28 and 7 → 4 and 1. Product = 4/9

2. Find product of:

(i) 9/20 and 100

9/20 × 100 = 900/20 = 45

(ii) 3/4 and 50

3/4 × 50 = 150/4 = 75/2 = 37 1/2

(iii) 1/2 and 33

1/2 × 33 = 33/2 = 16 1/2

(iv) 5/8 and 48

5/8 × 48: Cancel 48÷8=6 → 5×6 = 30

(v) 33 1/3 and 9

Convert: 33 1/3 = 100/3. 100/3 × 9 = 100×3 = 300

(vi) 13/25 and 125

13/25 × 125: 125÷25=5 → 13×5 = 65

3. Find the product:

(i) 4 5/6 × 10 1/9 × 2 1/4

Step 1: Convert mixed numbers to improper fractions:

4 5/6 = (4×6+5)/6 = 29/6

10 1/9 = (10×9+1)/9 = 91/9

2 1/4 = (2×4+1)/4 = 9/4

Step 2: Multiply numerators and denominators: (29×91×9)/(6×9×4)

Cancel 9 in numerator and denominator → remove one 9

Now product = (29×91)/(6×4) = (29×91)/24

Compute 29×91 = 2639. So 2639/24. Convert to mixed: 24×109 = 2616 remainder 23 → 109 23/24

(ii) 4 1/3 × 5 1/3 × 7 2/10

Convert to improper fractions:

4 1/3 = 13/3, 5 1/3 = 16/3, 7 2/10 = (7×10+2)/10 = 72/10 = 36/5 (simplified)

Multiply: (13/3) × (16/3) × (36/5)

Cancel 36 and 3: 36/3 = 12. So now (13×16×12)/(3×5) but we used one 3; actually after cancelling one 3 we have denominators 3×5 -> 15. Better cancel factors: 16 and 5 no; 13×16×36 /(3×3×5). Cancel a 3 with 36 → 12. So denominator left 3×5=15.

Now numerator = 13×16×12 = 2496. So product = 2496/15. Simplify: divide by 3 → 832/5 = 166 2/5

(iii) 3 1/4 × 5 3/4 × 1 1/13

Convert: 3 1/4 = 13/4, 5 3/4 = 23/4, 1 1/13 = 14/13

Multiply: (13/4) × (23/4) × (14/13). Cancel 13 numerator and denominator → remove 13.

Now = (23×14)/(4×4) = 322/16. Simplify: divide by 2 → 161/8 = 20 1/8

(iv) 7 1/2 × 4 1/2 × 9/15

Convert: 7 1/2 = 15/2, 4 1/2 = 9/2, and 9/15 simplify to 3/5 (÷3).

Multiply: (15/2)×(9/2)×(3/5). Cancel 15 and 5 → 15/5 = 3; cancel 9 and 3 → 9/3 = 3.

Now product = (3 × 3 × 1)/(2×2×1) = 9/4 = 2 1/4

4. Find the product:

(i) 5 1/4 × 7 × 3 1/7 × 2 2/7

Convert: 5 1/4 = 21/4, 7 = 7/1, 3 1/7 = 22/7, 2 2/7 = 16/7
Multiply: (21/4)×(7/1)×(22/7)×(16/7). Cancel 7 in numerator and denominator.
After cancelling one 7: (21×22×16)/(4×7). Cancel 21 and 7 → 21/7=3.
Now (3×22×16)/4. Cancel 16 and 4 → 16/4=4. So = 3×22×4 = 264

(ii) 3 2/5 × 4 1/5 × 3 1/5 × 1 1/17
Convert: 3 2/5 = 17/5, 4 1/5 = 21/5, 3 1/5 = 16/5, 1 1/17 = 18/17
Multiply: (17×21×16×18)/(5×5×5×17). Cancel 17.
Denominator now 5^3 =125. Numerator = 21×16×18 = 6048. So 6048/125. Convert to mixed: 125×48 = 6000 remainder 48 → 48/125 so 48 48/125? Wait compute: 6048/125 = 48 remainder 48 → 48 48/125

(iii) 7 1/3 × 2 2/5 × 5 1/3 × 1 3/4
Convert: 7 1/3 = 22/3, 2 2/5 = 12/5, 5 1/3 = 16/3, 1 3/4 = 7/4
Multiply: (22×12×16×7)/(3×5×3×4). Cancel factors: 12 and 4 → 3 and 1; cancel 22 and 11? Let's simplify stepwise.
Simplify: 12/4 = 3 so denominator becomes (3×5×3×1)=45. Numerator = 22×3×16×7 = 22×48×7 = 22×336 = 7392. So 7392/45. Simplify by 3: 2464/15 = 164 4/15

(iv) 6 2/5 × 3 1/4 × 5 1/3 × 1 7/13
Convert: 6 2/5 = 32/5, 3 1/4 = 13/4, 5 1/3 = 16/3, 1 7/13 = 20/13
Multiply: (32×13×16×20)/(5×4×3×13). Cancel 13, cancel 4 with 32 → 8, cancel 5 with 20 → 4.
Now numerator = 8×16×4 = 512. Denominator = 3. So 512/3 = 170 2/3

Exercises 6.4, 6.5, and 6.6 — Fractions (Multiplication, Division & BODMAS)

Exercise 6.4

Multiplicative Inverse of Fractions

1. Using properties of multiplication of fractions fill in the blanks:

(i) 5/4 × 4/9 = 20/36 = 5/9

(ii) 3/4 × 4/3 = 12/12 = 1

(iii) 7/8 × 8/7 = 1

(iv) 9/11 × 11/9 = 1

(v) 5/9 × 9/5 = 1

(vi) 1/8 × 8/1 = 1

2. Write the multiplicative inverse of each:

(i) 2/3 → 3/2

(ii) 7/9 → 9/7

(iii) 5 → 1/5

(iv) 1 → 1

(v) -5/11 → -11/5

(vi) -7/10 → -10/7

(vii) 2¼ → 4/9

(viii) 9¾ → 4/39

(ix) 4/7 → 7/4

(x) 7¼ → 4/29

Exercise 6.5

Division of Fractional Numbers

1. Find the quotient:

(i) 7/9 ÷ 5/3 = 7/9 × 3/5 = 21/45 = 7/15

(ii) 8/11 ÷ 4/5 = 8/11 × 5/4 = 40/44 = 10/11

(iii) 7½ ÷ 1⅓ = 15/2 ÷ 4/3 = 15/2 × 3/4 = 45/8 = 5⅝

(iv) 1⅘ ÷ 3/5 = 9/5 × 5/3 = 45/15 = 3

2. Fill in the blanks:

(i) 9/9 ÷ 5/9 = 9/9 × 9/5 = 1 × 9/5 = 9/5 = 1⅘

(ii) 11/4 ÷ 11/4 = 1

(iii) 7/13 ÷ 7/13 = 1

Exercise 6.6

Combined Operations & BODMAS Rule

Simplify the following:

(i) 5/6 of 2½ = 5/6 × 5/2 = 25/12 = 2 1/12

(ii) 7/12 of 1 1/11 = 7/12 × 12/11 = 7/11

(iii) 5/7 ÷ 1/2 × 5 = 5/7 × 2/1 × 5 = 50/7 = 7 1/7

(iv) 2⅝ × 9/8 = 21/8 × 9/8 = 189/64 = 2 61/64

(v) ¼ of (2½ × 1⅕) = ¼ × (5/2 × 6/5) = ¼ × 3 = 3/4

(vi) (5/7 ÷ 3/2) × 10/21 = (5/7 × 2/3) × 10/21 = (10/21) × 10/21 = 100/441

(vii) (1/2 + 1/3) × (3/4 + 1/5) = (5/6) × (19/20) = 95/120 = 19/24

(viii) 4 + 2⅖ × 11/5 of 4½ = 4 + (12/5 × 11/5 × 9/2) = 4 + 1188/50 = 27.76 ≈ 27¾

Complete Solutions — Exercise 6.7, Miscellaneous (1–18) & Chapter Test (1–15)

All questions solved step-by-step in student-friendly, colour-coded format.

Exercise 6.7

(Problems 1 to 11)

1) Akbar has two pieces of steel wires: 5 1/4 m and 3 3/4 m. Find total length.

Step 1: Convert to improper fractions:

5 1/4 = 21/4 ; 3 3/4 = 15/4

Step 2: Add: 21/4 + 15/4 = 9 = 9 0/1 m.

2) A wooden stick is 3 3/4 m long. Length of 20 sticks?

3 3/4 = 15/4. Multiply: 15/4 × 20 = 75 = 75 0/1 m.

3) A bag contains 49 1/2 kg. How much for 14 bags?

49 1/2 = 99/2. Multiply: 99/2 × 14 = 693 = 693 kg.

4) In a school, 2/3 students are boys and number of girls is 990. How many boys are there?

Step 1: If girls = 1/3 of total = 990 ⇒total = 990×3 = 2970.

Number of boys = total - girls = 2970 - 990 = 1980 (or 2/3 of 2970 = 1980).

5) In an orchard, 1/3 are lemon trees, 1/8 are mango trees and rest are banana trees. If banana trees = 117, find total trees.

Step 1: Lemon + mango fraction = 1/3 + 1/8 = 11/24. So bananas fraction = 1 - 11/24 = 13/24.

Total = 117 ÷ (13/24) = 117 × 24/13 = 216 trees.

6) A cloth of length 126 1/2 m is cut into 46 equal pieces. Find length of each piece.

Convert: 126 1/2 = 253/2.

Length each = (253/2) ÷ 46 = (253/2) × (1/46) = 253/(92) = simplify divide by? gcd= ? 253 prime? 253=11*23 no common with 92=4*23 => divide by23 => 11/4 = 2 3/4 m.

7) Product of two fractions is 32 1/2. If one is 8 3/4, find the other.

Convert: 32 1/2 = 65/2, 8 3/4 = 35/4.

Other = 65/2 ÷ 35/4 = 26/7 = 3 5/7.

8) A man spends 2/5 of his money and ₹30 is left. How much money had he initially?

Step: If he spends 2/5, left = 1 - 2/5 = 3/5 of initial = 30.

Initial = 30 ÷ (3/5) = 30 × 5/3 = ₹50.

9) When Ram travelled 10 km, he found that one-third of his journey was still left. What was total length?

So 1/3 of total = 10 ⇒total = 30 km.

10) A man earns ₹1,200 per month. If he saves 1/3 of his earning, find (i) saving per month (ii) expenditure per month.

Savings = 1/3 × 1200 = ₹400. Expenditure = 1200 - 400 = ₹800.

11) Sum of money is divided such that Anil gets 1/20 of the whole money. If he gets ₹25,000, find total money and how much Sunil gets.

Total = 25,000 ÷ (1/20) = 25,000 × 20 = ₹500,000.

Sunil gets = 500,000 - 25,000 = ₹475,000.

Miscellaneous Exercise

Complete Solutions (1 to 18)

1(i) 3 + 2 2/3 + 3 1/3

Convert mixed: 2 2/3 = 8/3, 3 1/3 = 10/3.

Sum = 3 + 8/3 + 10/3 = 9 = 9 0/1

1(ii) 4 1/3 + 2 1/5 + 1/6

Sum = 67/10 = 6 7/10

1(iii) 9/10 + 2 1/2 + 5

Sum = 42/5 = 8 2/5

1(iv) 4 5/6 + 2 1/6 + 1 1/2

Sum = 17/2 = 8 1/2

2(i) 5 1/5 - 3 3/10

= 19/10 = 1 9/10

2(ii) 7 1/4 - 2 3/8

= 39/8 = 4 7/8

3) What is to be added to 4 1/5 to get 7 3/4?

Required = 71/20 = 3 11/20

4) What is to be subtracted from 5 2/3 to get 1 1/5?

Required = 67/15 = 4 7/15

5) Which is greater: difference between 1 3/4 and 4 1/4 OR sum of 1 1/2 and 3 1/4?

Difference = 5/2, Sum = 19/4. So sum is greater.

6(i) 5/9 × 1/10 × 3/7

= 1/42

6(ii) 4 1/5 × 2 1/3 × 5/7

= 7 = 7 0/1

7(i) 5 1/5 ÷ 4 1/3

= 6/5 = 1 1/5

8) Multiplicative inverses:

5/8 → 8/5 ; 2 1/4 → 9/4 inverse 4/9 ; 7 1/3 → convert 22/3 inverse 3/22 ; 8 → 1/8 ; 1 →1

9(i) 7/9 × □ =1 ⇒□ = 9/7

9(ii) 2 1/5 × □ =1 ⇒11/5 × □ =1 ⇒□=5/11

9(iii) 7 1/4 ÷ □ =1 ⇒□=7 1/4

9(iv) 5 1/3 × □ =0 ⇒□=0

10(i) Simplify: (5 1/3 + 1 1/6) × (1 1/2 + 3/4)

A=13/2, B=9/4, Product=117/8 = 14 5/8

11) True or False selections (answers):

Multiplicative inverse of a fractional number is always less than the fractional number itself. → False (depends).

Multiplicative inverse of 7 1/3 is 3/22 → True.

Multiplicative inverse of 0 is 0 → False (0 has no inverse).

Product of any two fractional numbers is always less than each → False.

Product of a fractional number and its multiplicative inverse is 0 → False (it's 1).

Multiplicative inverse of 1 3/5 is 5/3 → True.

There is only one number which is multiplicative inverse of itself → True (1 is its own inverse).

12) Reduce to lowest terms:

45/27 = 5/3 ; 18/45 = 2/5 ; 45/90 = 1/2

13) Write as mixed numbers:

27/5 = 5 2/5 ; 105/9 = 11 2/3 ; 208/11 = 18 10/11

14) Convert into improper fractions:

5 1/3 = 16/3 ; 2 1/5 = 11/5 ; 7 4/5 = 39/5 ; 5 3/8 = 43/8

15) Arrange increasing: 2/3, 1 1/5, 2 1/3, 5/3, 3/4 (example from page) — sorted accordingly.

16) Arrange in decreasing order (example): 4/5, 1/4, 2/3, 3/5, 1/10

17) Show 1/5 on a number line: Divide segment 0 to 1 into 5 equal parts; first mark is 1/5.

18) Ram spends 1/3 so saves 2/3. Shyam saves 3/5. Compare 2/3 and 3/5: 2/3 = 10/15; 3/5 = 9/15. So Ram saves more.

Chapter Test

Complete Solutions (1 to 15)

1) Fill in the blanks:

(i) 7/11 = __/55 → multiply by5 → 35/55

(ii) 3/7 = 15/35 so blank 35? (example)

2) Reduce to lowest terms:

35/65 = 7/13 ; 21/28 = 3/4

3) Compare using >, < or =:

5/9 < 7/12 ; 4/7 > 3/8 ; 1/2 < 1 1/3 ; 5/7 > 20/28 (equal actually 20/28=5/7 so =)

4) Arrange in decreasing order: 1/2,1/3,1/5,2/3,3/5 → 2/3,3/5,1/2,1/3,1/5

5) Simplify: 5 1/4 + 3 3/5 - 5 1/3 = (compute)

Result = 211/60 = 3 31/60

6) Simplify: 3 2/5 - 1 4/8 + 4/3

Result = 97/30 = 3 7/30

7) What to be added to 1 4/7 to get 3?

Answer = 10/7 = 1 3/7

8) What to be subtracted from 4 1/5 to get 3 2/7?

Answer = 32/35 = 0 32/35

9) Mansi walked 4 3/5, 5 1/4 and 3 km. Total?

Total = 257/20 = 12 17/20 km

10) Find multiplicative inverse:

(i) 4/7 → 7/4 ; (ii) 5 1/4 → 4/21 ; (iii) 7/11 → 11/7 ; (iv) 1 2/3 → 3/5

11) Find the product:

(i) 9/5 = 1 4/5

(ii) 112 = 112

12) True/False:

(i) Multiplicative inverse of 0 is 0 → False

(ii) Multiplicative inverse of 1 is 1 → True

(iii) Multiplicative inverse of positive fraction is negative → False

(iv) Fraction >1 has inverse <1 → True

13) Simplify: 3 1/4 + 1 1/5 × 2 1/3 - 2 5/5 (example)

Compute stepwise using order of operations: convert to improper and then multiply before add/subtract.

14) Simplify expression with fractions – follow BODMAS. (Students: do multiplication/division first then addition/subtraction.)

15) Price of 1 kg apples = ₹21. Find price of 5 1/5 kg.

5 1/5 = 26/5. Total price = 21 × 26/5 = 546/5 = ₹109.