

Adding and Subtracting Fractions

Same Denominators

Directions: Add or subtract and write each answer in simplest form.

$$1. \frac{3}{7} + \frac{2}{7} = \frac{3+2}{7} = \boxed{\frac{5}{7}}$$

$$2. \frac{4}{9} + \frac{11}{9} = \frac{4+11}{9} = \frac{15}{9} = \frac{\cancel{3} \cdot 5}{\cancel{3} \cdot 3} = \boxed{\frac{5}{3} \text{ OR } 1\frac{2}{3}}$$

$$\begin{array}{r} 15 \\ \wedge \\ 3 \ 5 \end{array}$$

$$\begin{array}{r} 9 \\ \wedge \\ 3 \ 3 \end{array}$$

$$3 \overline{) \frac{5}{3}} \\ \underline{-3} \\ 2$$

$$3. -\frac{3}{5} + \left(-\frac{2}{5}\right) = \frac{-3 + -2}{5} = \frac{-5}{5} = \boxed{-1}$$

$$4. -6\frac{1}{12} - 3\frac{5}{12} = -\frac{73}{12} - \frac{41}{12} = \frac{-73 - 41}{12} = \frac{-114}{12}$$

$$\begin{array}{r} 114 \\ \wedge \\ 2 \ 57 \\ \wedge \\ 3 \ 19 \end{array}$$

$$\begin{array}{r} 12 \\ \wedge \\ 2 \ 6 \\ \wedge \\ 2 \ 3 \end{array}$$

$$= \frac{-\cancel{2} \cdot \cancel{3} \cdot 19}{\cancel{2} \cdot \cancel{2} \cdot \cancel{3}} = \boxed{\frac{-19}{2} \text{ OR } -9\frac{1}{2}}$$

$$2 \overline{) \frac{19}{2}} \\ \underline{-18} \\ 1$$

$$5. \frac{1}{3} - \left(-2\frac{2}{3}\right) = \frac{1}{3} - -\frac{8}{3} = \frac{1++8}{3} = \frac{9}{3} = \boxed{3}$$

$$6. -3\frac{7}{8} - 1\frac{2}{8} = \frac{-31}{8} - \frac{10}{8} = \frac{-31-10}{8} = \boxed{\frac{-41}{8} \text{ OR } -5\frac{1}{8}}$$

$$7. \frac{6x}{4} + \frac{12x}{4} = \frac{6x+12x}{4} = \frac{18x}{4} = \frac{\cancel{2} \cdot 3 \cdot 3 \cdot x}{\cancel{2} \cdot 2} = \boxed{\frac{9x}{2}}$$

$$\begin{array}{cc} 18 & 4 \\ \wedge & \wedge \\ 2 \ 9 & 2 \ 2 \\ & \wedge \\ & 3 \ 3 \end{array}$$

$$8. -\frac{4x}{9} - \frac{3x}{9} + \left(-\frac{8x}{9}\right) = \frac{-4x-3x+-8x}{9} = \frac{-15x}{9} = \frac{\cancel{3} \cdot 5 \cdot x}{\cancel{3} \cdot 3} = \boxed{\frac{-5x}{3}}$$

$$\begin{array}{ccc} -4x & + & 3x & + & -8x & & 15 & & 9 \\ \checkmark & & & & & & \wedge & & \wedge \\ -7x & + & -8x & & & & 3 \ 5 & & 3 \ 3 \\ & & \checkmark & & & & & & \\ & & -15x & & & & & & \end{array}$$

$$9. \frac{4}{8x} - \frac{12}{8x} = \frac{-4 + -12}{8x} = \frac{-16}{8x} = \boxed{\frac{-2}{x}}$$

$$10. \frac{5}{6y} - \left(-\frac{9}{6y}\right) = \frac{5 + +9}{6y} = \frac{14}{6y} = \frac{\cancel{2} \cdot 7}{\cancel{2} \cdot 3 \cdot y} = \boxed{\frac{7}{3y}}$$

$$\begin{array}{c} 14 \\ \wedge \\ 2 \cdot 7 \end{array} \quad \begin{array}{c} 6 \\ \wedge \\ 2 \cdot 3 \end{array}$$

Different Denominators

Directions: Add or subtract and write each answer in simplest form.

$$11. \frac{4}{5} - \frac{3}{2} = \frac{4 \cdot 2}{5 \cdot 2} - \frac{3 \cdot 5}{2 \cdot 5} = \frac{8}{10} - \frac{15}{10} = \frac{8 - 15}{10} = \boxed{\frac{-7}{10}}$$

$$5: 5, \textcircled{10}, 15, 20, 25$$

$$2: 2, 4, 6, 8, \textcircled{10}$$

$$LCD = 10$$

$$12. \frac{5}{8} + \left(-\frac{4}{15}\right) = \frac{5 \cdot 15}{8 \cdot 15} + \frac{-4 \cdot 8}{15 \cdot 8} = \frac{75}{120} + \frac{-32}{120} = \frac{75 + -32}{120} = \boxed{\frac{43}{120}}$$

8: 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96, 104, 112, 120

15: 15, 30, 45, 60, 75, 90, 105, 120

$$LCD = 120$$

$$13. 15\frac{1}{6} - 7\frac{3}{10} = \frac{91 \cdot 5}{6 \cdot 5} - \frac{73 \cdot 3}{10 \cdot 3} = \frac{455}{30} - \frac{219}{30} = \frac{455 - 219}{30} = \frac{236}{30}$$

6: 6, 12, 18, 24, 30

10: 10, 20, 30

$$LCD = 30$$

236

^
2 118
^
2 59

30
^
2 15
^
3 5

$$= \frac{\cancel{2} \cdot 2 \cdot 59}{\cancel{2} \cdot 3 \cdot 5}$$

$$= \boxed{\frac{118}{15} \text{ OR } 7\frac{13}{15}}$$

$$15 \overline{) 236} \\ \underline{-105} \\ 13$$

$$14. -2\frac{3}{4} + \left(-7\frac{1}{8}\right) = \frac{-11 \cdot 2}{4 \cdot 2} + \frac{-57}{8} = \frac{-22}{8} + \frac{-57}{8} = \frac{-22 + -57}{8}$$

4: 4, 8, 12, 16, 20

8: 8

$$LCD = 8$$

$$8 \overline{) -79} \\ \underline{-72} \\ -7$$

$$= \boxed{\frac{-79}{8} \text{ OR } -9\frac{7}{8}}$$

$$15. \frac{x}{12} + \frac{x}{8} = \frac{x \cdot 2}{12 \cdot 2} + \frac{x \cdot 3}{8 \cdot 3} = \frac{2x}{24} + \frac{3x}{24} = \frac{2x+3x}{24} = \boxed{\frac{5x}{24}}$$

12: 12, 24, 36, 48, 60

8: 8, 16, 24

$$LCD = 24$$

$$16. \frac{-3x}{8} + \frac{15x}{7} = \frac{-3x \cdot 7}{8 \cdot 7} + \frac{15x \cdot 8}{7 \cdot 8} = \frac{-21x}{56} + \frac{120x}{56} = \frac{-21+120x}{56} = \boxed{\frac{99x}{56}}$$

8: 8, 16, 24, 32, 40, 48, 56

7: 7, 14, 21, 28, 35, 42, 49, 56

$$LCD = 56$$

$$17. \frac{-2}{3x} + \frac{4}{5x} = \frac{-2 \cdot 5}{3x \cdot 5} + \frac{4 \cdot 3}{5x \cdot 3} = \frac{-10}{15x} + \frac{12}{15x} = \frac{-10+12}{15x} = \boxed{\frac{2}{15x}}$$

3: 3, 6, 9, 12, 15

5: 5, 10, 15

$$LCD = 15$$

$$18. \frac{x}{7} - \frac{3x}{5} = \frac{x \cdot 5}{7 \cdot 5} - \frac{3x \cdot 7}{5 \cdot 7} = \frac{5x}{35} - \frac{21x}{35} = \frac{5x - 21x}{35} = \frac{-16x}{35}$$

7: 7, 14, 21, 28, (35)

5: 5, 10, 15, 20, 25, 30, (35)

LCD = 35

$$19. -\frac{5w}{12} - \left(\frac{7w}{6}\right) + \frac{8w}{9} = \frac{-5w \cdot 3}{12 \cdot 3} - \frac{7w \cdot 6}{6 \cdot 6} + \frac{8w \cdot 4}{9 \cdot 4} = \frac{-15w}{36} - \frac{42w}{36} + \frac{32w}{36}$$

12: 12, 24, (36), 48, 60

6: 6, 12, 18, 24, 30, (36)

9: 9, 18, 27, (36), 45

LCD = 36

$$= \frac{-15w - 42w + 32w}{36} = \frac{-25w}{36}$$

$$-15w + 42w + 32w$$

$$\quad \checkmark$$

$$-57w + 32w$$

$$\quad \checkmark$$

$$-25w$$

$$20. \frac{-36}{5w} + \frac{8}{w} = \frac{-36}{5w} + \frac{8 \cdot 5}{1w \cdot 5} = \frac{-36}{5w} + \frac{40}{5w} = \frac{-36 + 40}{5w} = \frac{4}{5w}$$

5: (5), 10, 15, 20, 25

1: 1, 2, 3, 4, (5)

LCD = 5