

CHAPTER 6 SIMPLIFICATION

Exercise 6A

Simplify

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Q1

Answer :

Given expression:

$$= 21 - 12 \div 3 \times 2$$

$$= 21 - 4 \times 2 \quad \text{[Performing division]}$$

$$= 21 - 8 \quad \text{[Performing multiplication]}$$

$$= 13 \quad \text{[Performing subtraction]}$$

Q2

Answer :

Given expression:

$$= 16 + 8 \div 4 - 2 \times 3$$

$$= 16 + 2 - 2 \times 3 \quad \text{[Performing division]}$$

$$= 16 + 2 - 6 \quad \text{[Performing multiplication]}$$

$$= 18 - 6 \quad \text{[Performing addition]}$$

$$= 12 \quad \text{[Performing subtraction]}$$

Q3

Answer :

Given expression:

$$= 13 - (12 - 6 \div 3)$$

$$= 13 - (12 - 2) \quad \text{[Performing division]}$$

$$= 13 - 10 = 3 \quad \text{[Performing subtraction]}$$

Q4

Answer :

Given expression:

$$= 19 - [4 + \{16 - (12 - 2)\}]$$

$$= 19 - [4 + \{16 - 10\}] \quad \text{[Removing parentheses]}$$

$$= 19 - [4 + 6] \quad \text{[Removing braces]}$$

$$= 19 - 10 \quad \text{[Removing square brackets]}$$

$$= 9$$

Q5

Answer :

Given expression:

$$= 36 - [18 - \{14 - (15 - 4 + 2 \times 2)\}]$$

$$= 36 - [18 - \{14 - (15 - 2 \times 2)\}]$$

[Performing division]

$$= 36 - [18 - \{14 - (15 - 4)\}]$$

[Performing multiplication]

$$= 36 - [18 - \{14 - 11\}]$$

[Removing parentheses]

$$= 36 - [18 - 3]$$

[Removing braces]

$$= 36 - 15$$

[Removing square brackets]

$$= 21$$

Q6

Answer :

Given expression:

$$= 27 - [18 - \{16 - (5 - \overline{4 - 1})\}]$$

$$= 27 - [18 - \{16 - (5 - 3)\}]$$

[Removing bar]

$$= 27 - [18 - \{16 - 2\}]$$

[Removing parentheses]

$$= 27 - [18 - 14]$$

[Removing braces]

$$= 27 - 4$$

[Removing square brackets]

$$= 23$$

Q7

Answer :

Given expression:

$$= 4\frac{4}{5} \div \frac{3}{5} \text{ of } 5 + \frac{4}{5} \times \frac{3}{10} - \frac{1}{5}$$

$$= 4\frac{4}{5} \div \frac{3}{5} \times \frac{5}{1} + \frac{4}{5} \times \frac{3}{10} - \frac{1}{5}$$

(Removing 'of')

$$= \frac{24}{5} \div \frac{3}{1} + \frac{4}{5} \times \frac{3}{10} - \frac{1}{5}$$

$$= \frac{24}{5} \times \frac{1}{3} + \frac{4}{5} \times \frac{3}{10} - \frac{1}{5}$$

(Removing '÷')

$$= \frac{8}{5} + \frac{4}{5} \times \frac{3}{10} - \frac{1}{5}$$

(Removing '×')

$$= \frac{8}{5} + \frac{6}{25} - \frac{1}{5}$$

(Removing '×')

$$= \frac{40 + 6 - 5}{25} = \frac{41}{25} = 1\frac{16}{25}$$

Q8

Answer :

Given expression:

$$\begin{aligned} &= \left(\frac{2}{3} + \frac{4}{9}\right) \text{ of } \frac{3}{5} \div 1\frac{2}{3} \times 1\frac{1}{4} - \frac{1}{3} \\ &= \left(\frac{6+4}{9}\right) \text{ of } \frac{3}{5} \div 1\frac{2}{3} \times 1\frac{1}{4} - \frac{1}{3} && \text{(Removing parentheses)} \\ &= \frac{10}{9} \times \frac{3}{5} \div 1\frac{2}{3} \times 1\frac{1}{4} - \frac{1}{3} && \text{(Removing 'of')} \\ &= \frac{2}{3} \div \frac{5}{3} \times 1\frac{1}{4} - \frac{1}{3} \\ &= \frac{2}{3} \times \frac{3}{5} \times \frac{5}{4} - \frac{1}{3} && \text{(Removing '\div')} \\ &= \frac{2}{5} \times \frac{5}{4} - \frac{1}{3} \\ &= \frac{1}{2} - \frac{1}{3} && \text{(Removing '\times')} \\ &= \frac{(3-2)}{6} = \frac{1}{6} \end{aligned}$$

Q9

Answer :

The given expression

$$\begin{aligned} &= 7\frac{1}{3} \div \frac{2}{3} \text{ of } 2\frac{1}{5} + 1\frac{3}{8} \div 2\frac{3}{4} - 1\frac{1}{2} \\ &= \frac{22}{3} \div \frac{2}{3} \text{ of } \frac{11}{5} + \frac{11}{8} \div \frac{11}{4} - \frac{3}{2} \\ &= \frac{22}{3} \div \frac{2}{3} \times \frac{11}{5} + \frac{11}{8} \div \frac{11}{4} - \frac{3}{2} && \text{(Removing 'of')} \\ &= \frac{22}{3} \div \frac{22}{15} + \frac{11}{8} \div \frac{11}{4} - \frac{3}{2} \\ &= \frac{22}{3} \times \frac{15}{22} + \frac{11}{8} \div \frac{11}{4} - \frac{3}{2} && \text{(Removing '\div')} \\ &= 5 + \frac{11}{8} \times \frac{4}{11} - \frac{3}{2} && \text{(Removing '\div')} \\ &= 5 + \frac{1}{2} - \frac{3}{2} && \text{(On simplifying)} \\ &= \frac{10+1-3}{2} = \frac{8}{2} = 4 \end{aligned}$$

Q10

Answer :

Q10

Answer :

Given expression:

$$\begin{aligned} &= 5\frac{1}{7} - \left\{ 3\frac{3}{10} \div \left(2\frac{4}{5} - \frac{7}{10} \right) \right\} \\ &= \frac{36}{7} - \left\{ \frac{33}{10} \div \left(\frac{14}{5} - \frac{7}{10} \right) \right\} \\ &= \frac{36}{7} - \left\{ \frac{33}{10} \div \left(\frac{28-7}{10} \right) \right\} \\ &= \frac{36}{7} - \left\{ \frac{33}{10} \div \frac{21}{10} \right\} \\ &= \frac{36}{7} - \left\{ \frac{33}{10} \times \frac{10}{21} \right\} \\ &= \frac{36}{7} - \frac{11}{7} \\ &= \frac{36-11}{7} = \frac{25}{7} = 3\frac{4}{7} \end{aligned}$$

(Removing parentheses)

(Removing ' ÷ ')

(Removing braces)

(Simplifying)

Q11

Answer :

Given expression:

$$\begin{aligned} &= 9\frac{3}{4} \div \left[2\frac{1}{6} + \left\{ 4\frac{1}{3} - \left(1\frac{1}{2} + 1\frac{3}{4} \right) \right\} \right] \\ &= \frac{39}{4} \div \left[\frac{13}{6} + \left\{ \frac{13}{3} - \left(\frac{3}{2} + \frac{7}{4} \right) \right\} \right] \\ &= \frac{39}{4} \div \left[\frac{13}{6} + \left\{ \frac{13}{3} - \left(\frac{6+7}{4} \right) \right\} \right] \\ &= \frac{39}{4} \div \left[\frac{13}{6} + \left\{ \frac{13}{3} - \frac{13}{4} \right\} \right] \\ &= \frac{39}{4} \div \left[\frac{13}{6} + \left\{ \frac{52-39}{12} \right\} \right] \\ &= \frac{39}{4} \div \left[\frac{13}{6} + \frac{13}{12} \right] \\ &= \frac{39}{4} \div \left[\frac{26+13}{12} \right] \\ &= \frac{39}{4} \div \frac{39}{12} \\ &= \frac{39}{4} \times \frac{12}{39} = 3 \end{aligned}$$

(Removing parentheses)

(Removing braces)

(Removing square brack

(Removing ' ÷ ')

$$= \frac{39}{4} \div \left[\frac{13}{6} + \frac{13}{12} \right]$$

(Removing braces)

$$= \frac{39}{4} \div \left[\frac{26+13}{12} \right]$$

$$= \frac{39}{4} \div \frac{39}{12}$$

(Removing square bracket)

$$= \frac{39}{4} \times \frac{12}{39} = 3$$

(Removing '÷')

Q12

Answer :

Given expression:

$$= 4\frac{1}{10} - \left[2\frac{1}{2} - \left\{ \frac{5}{6} - \left(\frac{2}{5} + \frac{3}{10} - \frac{4}{15} \right) \right\} \right]$$

$$= \frac{41}{10} - \left[\frac{5}{2} - \left\{ \frac{5}{6} - \left(\frac{2}{5} + \frac{3}{10} - \frac{4}{15} \right) \right\} \right]$$

$$= \frac{41}{10} - \left[\frac{5}{2} - \left\{ \frac{5}{6} - \left(\frac{12+9-8}{30} \right) \right\} \right]$$

$$= \frac{41}{10} - \left[\frac{5}{2} - \left\{ \frac{5}{6} - \frac{13}{30} \right\} \right]$$

(Removing parentheses)

$$= \frac{41}{10} - \left[\frac{5}{2} - \left\{ \frac{25-13}{30} \right\} \right]$$

$$= \frac{41}{10} - \left[\frac{5}{2} - \frac{12}{30} \right]$$

(Removing braces)

$$= \frac{41}{10} - \left[\frac{75-12}{30} \right]$$

$$= \frac{41}{10} - \frac{63}{30}$$

(Removing square brackets)

$$= \frac{123-63}{30} = \frac{60}{30} = 2$$

Q13

Answer :

Given expression:

$$= 1\frac{5}{6} + \left[2\frac{2}{3} - \left\{ 3\frac{3}{4} \left(3\frac{4}{5} \div 9\frac{1}{2} \right) \right\} \right]$$

$$= \frac{11}{6} + \left[\frac{8}{3} - \left\{ \frac{15}{4} \left(\frac{19}{5} \div \frac{19}{2} \right) \right\} \right]$$

$$= \frac{11}{6} + \left[\frac{8}{3} - \left\{ \frac{15}{4} \left(\frac{19}{5} \times \frac{2}{19} \right) \right\} \right]$$

$$= \frac{11}{6} + \left[\frac{8}{3} - \left\{ \frac{15}{4} \times \frac{2}{5} \right\} \right]$$

$$= \frac{11}{6} + \left[\frac{8}{3} - \frac{3}{2} \right]$$

$$= \frac{11}{6} + \left[\frac{16-9}{6} \right]$$

$$= \frac{11}{6} + \frac{7}{6}$$

$$= \frac{18}{6} = 3$$

5/7

(Removing parentheses)

(Removing braces)

(Removing square brackets)

Q14

Answer :

Q14

Answer :

Given expression:

$$= 4\frac{4}{5} \div \left\{ 2\frac{1}{5} - \frac{1}{2} \left(1\frac{1}{4} - \overline{\frac{1}{4} - \frac{1}{5}} \right) \right\}$$

$$= \frac{24}{5} \div \left\{ \frac{11}{5} - \frac{1}{2} \left(\frac{5}{4} - \overline{\frac{1}{4} - \frac{1}{5}} \right) \right\}$$

$$= \frac{24}{5} \div \left\{ \frac{11}{5} - \frac{1}{2} \left(\frac{5}{4} - \frac{1}{20} \right) \right\}$$

(Removing bar)

$$= \frac{24}{5} \div \left\{ \frac{11}{5} - \frac{1}{2} \left(\frac{25-1}{20} \right) \right\}$$

$$= \frac{24}{5} \div \left\{ \frac{11}{5} - \frac{1}{2} \times \frac{24}{20} \right\}$$

(Removing parentheses)

$$= \frac{24}{5} \div \left\{ \frac{11}{5} - \frac{12}{20} \right\}$$

(Removing '×')

$$= \frac{24}{5} \div \left\{ \frac{44-12}{20} \right\}$$

$$= \frac{24}{5} \div \frac{32}{20}$$

(Removing braces)

$$= \frac{24}{5} \times \frac{20}{32}$$

(Removing '÷')

$$= \frac{3}{4} \times 4 = 3$$

Q15

Answer :

Given expression:

$$= 7\frac{1}{2} - \left[2\frac{1}{4} \div \left\{ 1\frac{1}{4} - \frac{1}{2} \left(\frac{3}{2} - \overline{\frac{1}{3} - \frac{1}{6}} \right) \right\} \right]$$

$$= \frac{15}{2} - \left[\frac{9}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \left(\frac{3}{2} - \overline{\frac{1}{3} - \frac{1}{6}} \right) \right\} \right]$$

$$= \frac{15}{2} - \left[\frac{9}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \left(\frac{3}{2} - \frac{1}{6} \right) \right\} \right]$$

(Removing bar)

$$= \frac{15}{2} - \left[\frac{9}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \left(\frac{9-1}{6} \right) \right\} \right]$$

$$= \frac{15}{2} - \left[\frac{9}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \times \frac{4}{3} \right\} \right]$$

(Removing parentheses)

$$= \frac{15}{2} - \left[\frac{9}{4} \div \left\{ \frac{5}{4} - \frac{2}{3} \right\} \right]$$

(Removing '×')

$$= \frac{15}{2} - \left[\frac{9}{4} \div \left\{ \frac{15-8}{12} \right\} \right]$$

(Removing braces)

$$= \frac{15}{2} - \left[\frac{9}{4} \div \frac{7}{12} \right]$$

$$= \frac{15}{2} - \left[\frac{9}{4} \times \frac{12}{7} \right]$$

(Removing '÷')

$$= \frac{15}{2} - \frac{27}{7}$$

(Removing square brackets)

$$= \frac{105-54}{14} = \frac{51}{14} = 3\frac{9}{14}$$