

Examples 5 in Rationals in Arithmetic 3

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Examples 5 in Rationals

0. $\frac{3}{4} \times \frac{7}{5}$

1. $\frac{12}{32} \times \frac{18}{15}$

2. $\frac{4}{5} \times \frac{5}{4}$

3. $\frac{2}{3} \times \frac{5}{6} \times \frac{3}{7} \times \frac{6}{15} \times \frac{14}{3} \times \frac{3}{2}$

4. $\frac{3}{4} \div 7$

5. $\frac{5}{6} \div \frac{10}{3}$

6. $\frac{12}{5} \div \frac{3}{10}$

7. $3.5 \div \frac{14}{5}$

8. $\frac{4}{9} \div \frac{7}{12} \div \frac{16}{3} \div \frac{14}{9}$

9.
$$\frac{\frac{1}{4} \div [62 + \frac{1}{4} - \{8.5 - 0.4 \times (1 + \frac{7}{8})\}] \div 0.125}{[2 - \{5.55 \times (1 + \frac{1}{3}) - 2.7 \div 0.4\}] \div 0.135}$$

A.
$$\frac{\frac{7}{18} \times (4 + \frac{1}{2}) \times \frac{1}{6}}{\{(13 + \frac{1}{3}) - (3 + \frac{3}{4}) \div \frac{5}{16}\} \times (2 + \frac{7}{8})}$$

B.
$$\frac{(\frac{1}{3} \div 0.3) \times 0.1}{0.8 \times (1.5 - \frac{1}{4})}$$

C.
$$(2 + \frac{2}{5}) - \frac{1}{\frac{1}{2} + \frac{1}{1 - \frac{1}{2}}}$$

D.
$$\frac{0.5 + 4.8 \times \frac{1}{6}}{(0.5 \times 4.8 \times \frac{1}{6}) + 1 + \frac{1}{1 - \frac{1}{2}}}$$

E.
$$\left[36.6 - \left[\left(\frac{6}{3 + \frac{1}{3}} \right) + \frac{1}{3} \right] \times \left(4 + \frac{1}{2} \right) \right] \div \left[\left(7 + \frac{1}{20} \right) + 6.35 \right]$$

**Suggestions or Solutions
To the Examples 5 in Rationals**

$$0. \quad \frac{3}{4} \times \frac{7}{5} = \frac{3 \times 7}{4 \times 5} = \frac{21}{20}$$

$$1. \quad \frac{12}{32} \times \frac{18}{15} = \frac{3 \times 4}{8 \times 4} \times \frac{6 \times 3}{5 \times 3} = \frac{3}{8} \times \frac{6}{5} = \frac{3 \times 6}{8 \times 5} = \frac{18}{40} = \frac{9}{20}$$

$$2. \quad \frac{4}{5} \times \frac{5}{4} = \frac{20}{20} = 1$$

$$3. \quad \frac{2}{3} \times \frac{5}{6} \times \frac{3}{7} \times \frac{6}{15} \times \frac{14}{3} \times \frac{3}{2} = \frac{2}{3} \times \frac{3}{7} \times \frac{5}{6} \times \frac{6}{15} \times \frac{14}{3} \times \frac{3}{2}$$

$$= \left(\frac{2}{3} \times \frac{3}{7}\right) \times \left(\frac{5}{6} \times \frac{6}{15}\right) \times \left(\frac{14}{3} \times \frac{3}{2}\right) = \frac{2}{7} \times \frac{5}{15} \times \frac{14}{2} = \frac{2}{7} \times \frac{1}{3} \times 7 = \frac{2}{7} \times 7 \times \frac{1}{3} = 2 \times \frac{1}{3} = \frac{2}{3}$$

$$4. \quad \frac{3}{4} \div 7 = \frac{3}{4} \times \frac{1}{7} = \frac{3}{28}$$

$$5. \quad \frac{5}{6} \div \frac{10}{3} = \frac{5}{6} \times \frac{3}{10} = \frac{5}{2 \times 3} \times \frac{3}{5 \times 2} = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

$$6. \quad \frac{12}{5} \div \frac{3}{10} = \frac{12}{5} \times \frac{10}{3} = \frac{4 \times 3}{5} \times \frac{5 \times 2}{3} = \frac{4 \times 3}{1} \times \frac{1 \times 2}{3} = \frac{4 \times 1}{1} \times \frac{1 \times 2}{1} = 4 \times 2 = 8$$

$$7. \quad 3.5 \div \frac{14}{5} = \frac{7}{2} \times \frac{5}{14} = \frac{7}{2} \times \frac{5}{7 \times 2} = \frac{1}{2} \times \frac{5}{1 \times 2} = \frac{5}{4}$$

$$8. \quad \frac{4}{9} \div \frac{7}{12} \div \frac{16}{3} \div \frac{14}{9} = \frac{4}{9} \times \frac{12}{7} \times \frac{3}{16} \times \frac{9}{14} = \frac{4}{3} \times \frac{4}{7} \times \frac{3}{16} \times \frac{9}{14}$$

$$= \frac{4}{1} \times \frac{4}{7} \times \frac{1}{16} \times \frac{9}{14} = \frac{4}{1} \times \frac{1}{7} \times \frac{1}{4} \times \frac{9}{14} = \frac{1}{1} \times \frac{1}{7} \times \frac{1}{1} \times \frac{9}{14} = \frac{1}{7} \times \frac{9}{14} = \frac{9}{98}$$

$$9. \frac{\frac{1}{4} \div [62 + \frac{1}{4} - \{8.5 - 0.4 \times (1 + \frac{7}{8})\} \div 0.125]}{[2 - \{5.55 \times (1 + \frac{1}{3}) - 2.7 \div 0.4\}] \div 0.135}$$

$$= \frac{\frac{1}{4} \div [62 + \frac{1}{4} - (\frac{85}{10} - \frac{4}{10} \times \frac{15}{8}) \div \frac{125}{1000}]}{[2 - (\frac{555}{100} \times \frac{4}{3} - \frac{27}{10} \div \frac{4}{10})] \div \frac{135}{1000}} = \frac{\frac{1}{4} \div [62 + \frac{1}{4} - (\frac{17 \times 5}{2 \times 5} - \frac{2 \times 2}{2 \times 5} \times \frac{15}{8}) \div \frac{125}{125 \times 8}]}{[2 - (\frac{111 \times 5}{20 \times 5} \times \frac{4}{3} - \frac{27}{10} \div \frac{2 \times 2}{2 \times 5})] \div \frac{27 \times 5}{200 \times 5}}$$

$$= \frac{\frac{1}{4} \div [62 + \frac{1}{4} - (\frac{17}{2} - \frac{2}{5} \times \frac{15}{8}) \div \frac{1}{8}]}{[2 - (\frac{111}{20} \times \frac{4}{3} - \frac{27}{10} \div \frac{2}{5})] \div \frac{27}{200}} = \frac{\frac{1}{4} \div [62 + \frac{1}{4} - (\frac{17}{2} - \frac{1}{1} \times \frac{3}{4}) \times 8]}{[2 - (\frac{111}{20} \times \frac{4}{3} - \frac{27}{10} \times \frac{5}{2})] \times \frac{200}{27}}$$

$$= \frac{\frac{1}{4} \div [62 + \frac{1}{4} - (\frac{17}{2} - \frac{3}{4}) \times 8]}{[2 - (\frac{37}{5} \times \frac{1}{1} - \frac{27}{2} \times \frac{1}{2})] \times \frac{200}{27}} = \frac{\frac{1}{4} \div [62 + \frac{1}{4} - (\frac{34}{4} - \frac{3}{4}) \times 8]}{[2 - (\frac{37}{5} - \frac{27}{4})] \times \frac{200}{27}}$$

$$= \frac{\frac{1}{4} \div [62 + \frac{1}{4} - \frac{31}{4} \times 8]}{[2 - \frac{148 - 135}{20}] \times \frac{200}{27}} = \frac{\frac{1}{4} \div [62 + \frac{1}{4} - 31 \times 2]}{[2 - \frac{13}{20}] \times \frac{200}{27}} = \frac{\frac{1}{4} \div [62 + \frac{1}{4} - 62]}{\frac{27}{20} \times \frac{200}{27}} = \frac{\frac{1}{4} \div \frac{1}{4}}{\frac{1}{1} \times \frac{10}{1}} = \frac{1}{10}$$

$$A. \frac{\frac{7}{18} \times (4 + \frac{1}{2}) \times \frac{1}{6}}{\{(13 + \frac{1}{3}) - (3 + \frac{3}{4}) \div \frac{5}{16}\} \times (2 + \frac{7}{8})} = \frac{\frac{7}{18} \times \frac{9}{2} \times \frac{1}{6}}{(\frac{40}{3} - \frac{15}{4} \times \frac{16}{5}) \times \frac{23}{8}} = \frac{\frac{7}{2} \times \frac{1}{2} \times \frac{1}{6}}{(\frac{40}{3} - \frac{3}{1} \times \frac{4}{1}) \times \frac{23}{8}}$$

$$= \frac{\frac{7}{4} \times \frac{1}{6}}{(\frac{40}{3} - 12) \times \frac{23}{8}} = \frac{\frac{7}{24}}{\frac{4}{3} \times \frac{23}{8}} = \frac{\frac{7}{24}}{\frac{1}{3} \times \frac{23}{2}} = \frac{\frac{7}{24}}{\frac{23}{6}} = \frac{\frac{7}{24} \times 6}{\frac{23}{6} \times 6} = \frac{\frac{7}{4}}{23} = \frac{\frac{7}{4} \times 4}{23 \times 4} = \frac{7}{92}$$

$$\begin{aligned}
 \text{B. } \frac{(\frac{1}{3} \div 0.3) \times 0.1}{0.8 \times (1.5 - \frac{1}{4})} &= \frac{(\frac{1}{3} \div \frac{3}{10}) \times \frac{1}{10}}{\frac{8}{10} \times (\frac{15}{10} - \frac{1}{4})} = \frac{\frac{1}{3} \times \frac{10}{3} \times \frac{1}{10}}{\frac{8}{10} \times \frac{30-5}{20}} = \frac{\frac{1}{3} \times \frac{1}{3} \times \frac{1}{1}}{\frac{8}{10} \times \frac{25}{20}} = \frac{\frac{1}{9}}{\frac{8}{10} \times \frac{5}{4}} \\
 &= \frac{\frac{1}{9}}{\frac{2}{2} \times \frac{1}{1}} = \frac{\frac{1}{9}}{1 \times 1} = \frac{1}{9}
 \end{aligned}$$

$$\text{C. } (2 + \frac{2}{5}) - \frac{1}{\frac{1}{2} + \frac{1}{1-\frac{1}{2}}}$$

$$\text{To begin with, we can have } \frac{1}{\frac{1}{2} + \frac{1}{1-\frac{1}{2}}} = \frac{1}{\frac{1}{2} + \frac{1}{\frac{1}{2}}} = \frac{1}{\frac{1}{2} + \frac{1 \times 2}{\frac{1}{2} \times 2}} = \frac{1}{\frac{1}{2} + \frac{2}{1}} = \frac{1}{\frac{1}{2} + 2} = \frac{1}{\frac{5}{2}} = \frac{2}{5}.$$

$$\text{So we get } (2 + \frac{2}{5}) - \frac{1}{\frac{1}{2} + \frac{1}{1-\frac{1}{2}}} = (2 + \frac{2}{5}) - \frac{2}{5} = 2 + \frac{2}{5} - \frac{2}{5} = 2.$$

$$\begin{aligned}
 \text{D. } \frac{0.5 + 4.8 \times \frac{1}{6}}{(0.5 \times 4.8 \times \frac{1}{6}) + 1 + \frac{1}{1-\frac{1}{2}}} &= \frac{\frac{1}{2} + \frac{48}{10} \times \frac{1}{6}}{(\frac{1}{2} + \frac{48}{10} \times \frac{1}{6}) + 1 + \frac{1}{\frac{1}{2}}} = \frac{\frac{1}{2} + \frac{8}{10} \times \frac{1}{1}}{(\frac{1}{2} + \frac{8}{10} \times \frac{1}{1}) + 1 + 2} \\
 &= \frac{\frac{1}{2} + \frac{4}{5}}{(\frac{1}{2} + \frac{4}{5}) + 3} = \frac{1 + \frac{2}{5}}{1 + \frac{2}{5} + 3} = \frac{\frac{7}{5}}{4 + \frac{2}{5}} = \frac{\frac{7}{5}}{\frac{22}{5}} = \frac{\frac{7}{5} \times 5}{\frac{22}{5} \times 5} = \frac{7}{22}
 \end{aligned}$$

$$\text{E. } \left[36.6 - \left[\left(\frac{6}{3 + \frac{1}{3}} \right) + \frac{1}{3} \right] \times \left(4 + \frac{1}{2} \right) \right] \div \left[\left(7 + \frac{1}{20} \right) + 6.35 \right]$$

$$= \left[\frac{366}{10} - \left[\left(\frac{6}{\frac{10}{3}} \right) + \frac{1}{3} \right] \times \frac{9}{2} \right] \div \left[\frac{141}{20} + \frac{635}{100} \right] = \left[\frac{366}{10} - \left[\frac{18}{10} + \frac{1}{3} \right] \times \frac{9}{2} \right] \div \left[\frac{705}{100} + \frac{635}{100} \right]$$

$$= \left[\frac{366}{10} - \left[\frac{54 + 10}{30} \right] \times \frac{9}{2} \right] \div \left[\frac{1340}{100} \right] = \left[\frac{366}{10} - \frac{64}{30} \times \frac{9}{2} \right] \div \frac{134}{10}$$

$$= \left[\frac{366}{10} - \frac{32}{10} \times \frac{3}{1} \right] \times \frac{10}{134} = \left[\frac{366}{10} - \frac{96}{10} \right] \times \frac{10}{134} = \frac{270}{10} \times \frac{10}{134} = \frac{270}{134} = \frac{135}{67}$$