

العمليات على الأعداد (الناطقة)

1

أحسب ثم اختزل النتائج :

$$A = \frac{5}{2} - \frac{3}{3} \quad , \quad B = \frac{5}{6} + \frac{3}{4} \quad , \quad C = \frac{3}{4} - \frac{6}{7} \quad , \quad D = \frac{8-2.5}{0.7} \quad , \quad E = \frac{0.3}{5 + \frac{1}{7}}$$

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منه :

$$A = \frac{5}{2} - \frac{3}{3} = \frac{4}{5} \times \frac{3}{2} = \frac{4 \times 3}{5 \times 2} = \frac{4 \times 3}{5 \times 2} = \frac{2 \times 3}{5 \times 1} = \frac{6}{5}$$

$$\frac{5}{6} + \frac{3}{4} = \frac{5 \times 2}{6 \times 2} + \frac{3 \times 3}{4 \times 3} = \frac{10}{12} + \frac{9}{12} = \frac{10+9}{12} = \frac{19}{12}$$

$$B = \frac{19}{12} = \frac{19}{12} \times \frac{12}{7} = \frac{19 \times 12}{12 \times 7} = \frac{19 \times \cancel{12}}{\cancel{12} \times 7} = \frac{19}{7}$$

$$\frac{3}{4} - \frac{6}{7} = \frac{3 \times 7}{4 \times 7} - \frac{6 \times 4}{7 \times 4} = \frac{21}{28} - \frac{24}{28} = \frac{21-24}{28} = -\frac{3}{28}$$

$$\frac{7}{12} + \frac{2}{3} = \frac{7}{12} + \frac{2 \times 4}{3 \times 4} = \frac{7}{12} + \frac{8}{12} = \frac{7+8}{12} = \frac{15}{12} = \frac{5 \times 3}{4 \times 3} = \frac{5 \times \cancel{3}}{4 \times \cancel{3}} = \frac{5}{4}$$

$$C = \frac{-3}{5} - \frac{3}{28} = -\frac{3}{28} \times \frac{4}{5} = -\frac{3 \times 4}{28 \times 5} = -\frac{3 \times \cancel{4}}{\cancel{28} \times 5} = -\frac{3 \times 1}{7 \times 5} = -\frac{3}{35}$$

$$D = \frac{8-2.5}{0.7} = \frac{5.5}{0.7} = \frac{5.5 \times 10}{0.7 \times 10} = \frac{55}{7}$$

$$5 + \frac{1}{7} = \frac{5}{1} + \frac{1}{7} = \frac{5 \times 7}{1 \times 7} + \frac{1}{7} = \frac{35}{7} + \frac{1}{7} = \frac{35+1}{7} = \frac{36}{7}$$

$$E = \frac{0.3}{\frac{36}{7}} = \frac{3}{10} \times \frac{7}{36} = \frac{3 \times 7}{10 \times 36} = \frac{\cancel{3} \times 7}{10 \times \cancel{36}^{12}} = \frac{1 \times 7}{10 \times 12} = \frac{7}{120}$$

2

أنجز المجاميع التالية ثم بسّط النتائج :

$$A = \left(\frac{-5}{-6} \right) + \left(\frac{-3}{+4} \right) \quad , \quad B = \left(\frac{-7}{+12} \right) + \left(\frac{+1}{-3} \right) \quad , \quad C = (+4) + \left(\frac{-2}{+3} \right) \quad , \quad D = \left(\frac{-5}{-9} \right) + \left(\frac{-1}{-6} \right)$$

$$A = \left(\frac{5}{6} \right) + \left(\frac{-3}{4} \right) = \frac{5}{6} - \frac{3}{4} = \frac{5 \times 2}{6 \times 2} - \frac{3 \times 3}{4 \times 3} = \frac{10}{12} - \frac{9}{12} = \frac{10-9}{12} = \frac{1}{12}$$

$$B = \left(\frac{-7}{12} \right) + \left(\frac{-1}{3} \right) = -\frac{7}{12} - \frac{1}{3} = -\frac{7}{12} - \frac{1 \times 4}{3 \times 4} = -\frac{7}{12} - \frac{4}{12} = \frac{-7-4}{12} = -\frac{11}{12}$$

$$C = 4 + \left(\frac{-2}{3} \right) = 4 - \frac{2}{3} = \frac{4}{1} - \frac{2}{3} = \frac{4 \times 3}{1 \times 3} - \frac{2}{3} = \frac{12}{3} - \frac{2}{3} = \frac{12-2}{3} = \frac{10}{3}$$

$$D = \left(\frac{5}{9} \right) + \left(\frac{1}{6} \right) = \frac{5}{9} + \frac{1}{6} = \frac{5 \times 4}{9 \times 4} + \frac{1 \times 6}{6 \times 6} = \frac{20}{36} + \frac{6}{36} = \frac{20+6}{36} = \frac{26}{36} = \frac{13}{18}$$

3

أنجز الفروق التالية ثم بسّط النتائج :

$$A = \left(\frac{-4}{-7} \right) - \left(\frac{-1}{+3} \right) \quad , \quad B = \left(\frac{-5}{+6} \right) - \left(\frac{-3}{+4} \right) \quad , \quad C = \left(\frac{+11}{+12} \right) - \left(\frac{+5}{-8} \right) \quad , \quad D = \left(\frac{+5}{-12} \right) - \left(\frac{-2}{+9} \right)$$

$$A = \left(\frac{4}{7} \right) - \left(\frac{-1}{3} \right) = \frac{4}{7} + \frac{1}{3} = \frac{4 \times 3}{7 \times 3} + \frac{1 \times 7}{3 \times 7} = \frac{12}{21} + \frac{7}{21} = \frac{12+7}{21} = \frac{19}{21}$$

$$B = \left(\frac{-5}{6} \right) - \left(\frac{-3}{4} \right) = -\frac{5}{6} + \frac{3}{4} = -\frac{5 \times 2}{6 \times 2} + \frac{3 \times 3}{4 \times 3} = -\frac{10}{12} + \frac{9}{12} = \frac{-10+9}{12} = -\frac{1}{12}$$

$$C = \left(\frac{11}{12} \right) - \left(\frac{-5}{8} \right) = \frac{11}{12} + \frac{5}{8} = \frac{11 \times 2}{12 \times 2} + \frac{5 \times 3}{8 \times 3} = \frac{22}{24} + \frac{15}{24} = \frac{22+15}{24} = \frac{37}{24}$$

$$D = \left(\frac{-5}{12} \right) - \left(\frac{-2}{9} \right) = -\frac{5}{12} + \frac{2}{9} = -\frac{5 \times 3}{12 \times 3} + \frac{2 \times 4}{9 \times 4} = -\frac{15}{36} + \frac{8}{36} = \frac{-15+8}{36} = -\frac{7}{36}$$

4

أنجز الجداءات التالية ثم بسّط النتائج :

$$A = \left(\frac{-4}{+5} \right) \times \left(\frac{-7}{-8} \right) \quad , \quad B = \left(\frac{+5}{-7} \right) \times \left(\frac{-3}{+4} \right) \quad , \quad C = \left(\frac{+3}{-8} \right) \times \left(\frac{+5}{+9} \right) \quad , \quad D = \left(\frac{-4}{-7} \right) \times \left(\frac{-5}{-8} \right)$$

عندما تكون الحسابات المطلوبة معقدة، يُستحسن تفكيكها إلى حسابات أبسط. هنا، نحسب البسط والمقام كلاهما على حدى :

$$\begin{aligned} -\frac{2}{7} + 1 + \frac{1}{21} &= -\frac{2 \times 3}{7 \times 3} + \frac{1 \times 21}{1 \times 21} + \frac{1}{21} = -\frac{6}{21} + \frac{21}{21} + \frac{1}{21} = \frac{-6+21+1}{21} = \frac{16}{21} \\ \frac{5}{6} - \frac{1}{3} - \frac{5}{9} &= \frac{5 \times 3}{6 \times 3} - \frac{1 \times 6}{3 \times 6} - \frac{5 \times 2}{9 \times 2} = \frac{15}{18} - \frac{6}{18} - \frac{10}{18} = \frac{15-6-10}{18} = -\frac{1}{18} \end{aligned}$$

لدينا :

$$A = \frac{16}{-\frac{1}{18}} = \frac{16}{21} \times (-18) = -\frac{16 \times 18}{21} = -\frac{16 \times 3}{21 \times 7} = -\frac{16 \times 6}{7} = \boxed{-\frac{96}{7}}$$

منه :

$$\frac{5}{2} - 6 - \frac{11}{8} = \frac{5 \times 4}{2 \times 4} - \frac{6 \times 8}{1 \times 8} - \frac{11}{8} = \frac{20}{8} - \frac{48}{8} - \frac{11}{8} = \frac{20-48-11}{8} = -\frac{39}{8}$$

بالمثل :

$$-1 + \frac{4}{15} + \frac{1}{12} = -\frac{1 \times 60}{1 \times 60} + \frac{4 \times 4}{15 \times 4} + \frac{1 \times 5}{12 \times 5} = \frac{-60+16+5}{60} = -\frac{39}{60}$$

و

$$B = \frac{-\frac{39}{8}}{-\frac{39}{60}} = \left(-\frac{39}{8}\right) \times \left(-\frac{60}{39}\right) = +\frac{39 \times 60}{8 \times 39} = \frac{39 \times 2}{8 \times 39} = \frac{1 \times 15}{2 \times 1} = \boxed{\frac{15}{2}}$$

منه :

$$2 - \frac{4}{5} - \frac{3}{2} = \frac{2 \times 10}{1 \times 10} - \frac{4 \times 2}{5 \times 2} - \frac{3 \times 5}{2 \times 5} = \frac{20}{10} - \frac{8}{10} - \frac{15}{10} = \frac{20-8-15}{10} = -\frac{3}{10}$$

أيضاً :

$$\frac{13}{6} - \frac{3}{4} + \frac{1}{3} = \frac{13 \times 2}{6 \times 2} - \frac{3 \times 3}{4 \times 3} + \frac{1 \times 4}{3 \times 4} = \frac{26}{12} - \frac{9}{12} + \frac{4}{12} = \frac{26-9+4}{12} = \frac{21}{12} = \frac{7}{4}$$

و

$$C = \frac{-\frac{10}{7}}{\frac{3}{4}} = \left(-\frac{10}{7}\right) \times \left(\frac{4}{3}\right) = -\frac{3 \times 4}{10 \times 7} = -\frac{3 \times 2}{5 \times 7} = \boxed{-\frac{6}{35}}$$

منه :

7 أحسب ثم اختزل النتائج :

$$B = \frac{4 + \frac{1}{3} + \frac{1}{5}}{6} - \frac{5 + \frac{5}{9} - \frac{4}{3}}{10}, \quad A = \frac{\frac{1}{4} + \frac{1}{5} + 5}{2} - \frac{8 + \frac{2}{3} - \frac{1}{6}}{20}$$

$$-1 + \frac{1}{2} - \frac{3}{4}$$

$$D = \frac{\frac{11}{12} + \frac{1}{8}}{3 - \frac{3}{7}} \times \frac{-2 + \frac{2}{9}}{\frac{5}{6} - \frac{3}{2}} \times \frac{2 + \frac{3}{7}}{4 - \frac{2}{9}}, \quad C = \frac{\frac{3}{5} - \frac{1}{2}}{3 - \frac{1}{4}} \times \frac{\frac{1}{6} + \frac{2}{9}}{\frac{3}{8} - 1} \times \frac{-8 + \frac{5}{2}}{1 - \frac{3}{10}}$$

$$A = \left(-\frac{4}{5}\right) \times \left(+\frac{7}{8}\right) = -\frac{4 \times 7}{5 \times 8} = -\frac{1 \times 7}{5 \times 2} = \boxed{-\frac{7}{10}}$$

$$B = \left(-\frac{5}{7}\right) \times \left(-\frac{3}{4}\right) = +\frac{5 \times 3}{7 \times 4} = \boxed{\frac{15}{28}}$$

$$C = \left(-\frac{3}{8}\right) \times \left(+\frac{5}{9}\right) = -\frac{3 \times 5}{8 \times 9} = -\frac{1 \times 5}{8 \times 3} = \boxed{-\frac{5}{24}}$$

$$D = \left(+\frac{4}{7}\right) \times \left(+\frac{5}{8}\right) = +\frac{4 \times 5}{7 \times 8} = \frac{1 \times 5}{7 \times 2} = \boxed{\frac{5}{14}}$$

5 أنجز حواصل القسمة التالية ثم بسّط النتائج :

$$D = \left(+\frac{4}{+7}\right) : \left(-\frac{5}{-8}\right), \quad C = \left(-\frac{15}{+7}\right) : \left(-\frac{3}{-2}\right), \quad B = \left(-\frac{4}{-15}\right) : \left(+\frac{3}{-5}\right), \quad A = \left(-\frac{5}{+16}\right) : \left(-\frac{7}{+8}\right)$$

$$A = \left(-\frac{5}{16}\right) : \left(-\frac{7}{8}\right) = \left(-\frac{5}{16}\right) \times \left(-\frac{8}{7}\right) = +\frac{5 \times 8}{16 \times 7} = \frac{5 \times 1}{2 \times 7} = \boxed{\frac{5}{14}}$$

$$B = \left(+\frac{4}{15}\right) : \left(-\frac{3}{5}\right) = \left(+\frac{4}{15}\right) \times \left(-\frac{5}{3}\right) = -\frac{4 \times 5}{15 \times 3} = -\frac{4 \times 1}{3 \times 3} = \boxed{-\frac{4}{9}}$$

$$C = \left(-\frac{15}{7}\right) : \left(+\frac{3}{2}\right) = \left(-\frac{15}{7}\right) \times \left(+\frac{2}{3}\right) = -\frac{15 \times 2}{7 \times 3} = -\frac{5 \times 2}{7 \times 1} = \boxed{-\frac{10}{7}}$$

$$D = \left(+\frac{4}{7}\right) : \left(+\frac{5}{8}\right) = \left(+\frac{4}{7}\right) \times \left(+\frac{8}{5}\right) = +\frac{4 \times 8}{7 \times 5} = \boxed{\frac{32}{35}}$$

6 أحسب ثم اختزل النتائج :

$$C = \frac{2 - \frac{4}{5} - \frac{3}{2}}{\frac{13}{6} - \frac{3}{4} + \frac{1}{3}}, \quad B = \frac{\frac{5}{2} - 6 - \frac{11}{8}}{-1 + \frac{4}{15} + \frac{1}{12}}, \quad A = \frac{-\frac{2}{7} + 1 + \frac{1}{21}}{\frac{5}{6} - \frac{1}{3} - \frac{5}{9}}$$

$$c = -1 + \frac{1}{2} - \frac{3}{4} = -\frac{1 \times 4}{1 \times 4} + \frac{1 \times 2}{2 \times 2} - \frac{3}{4} = -\frac{4}{4} + \frac{2}{4} - \frac{3}{4} = \frac{-4+2-3}{4} = -\frac{5}{4}$$

$$A = \frac{\frac{a}{6} - \frac{b}{10}}{c} = \frac{\frac{1}{-\frac{5}{4}}}{-\frac{5}{4}} = \frac{1}{3} \times \left(-\frac{4}{5}\right) = -\frac{1 \times 4}{3 \times 5} = \boxed{-\frac{4}{15}}$$

بالتالي:

$$\text{نكتب } C = \frac{a}{b} \times \frac{c}{d} \times \frac{e}{f} \text{ حيث } a = \frac{3}{5} - \frac{1}{2}, b = 3 - \frac{1}{4}, c = \frac{1}{6} + \frac{2}{9}, d = \frac{3}{8} - 1, e = -8 + \frac{5}{2}, f = 1 - \frac{3}{10}$$

$$\text{لدينا: } a = \frac{6-5}{10} = \frac{1}{10}, b = \frac{12-1}{4} = \frac{11}{4}, \frac{a}{b} = \frac{\frac{1}{10}}{\frac{11}{4}} = \frac{1}{10} \times \frac{4}{11} = \frac{4}{110} = \frac{2}{55}$$

$$c = \frac{3+4}{18} = \frac{7}{18}, d = \frac{3-8}{8} = -\frac{5}{8}, \frac{c}{d} = \frac{\frac{7}{18}}{-\frac{5}{8}} = -\frac{7}{18} \times \frac{8}{5} = -\frac{56}{90} = -\frac{28}{45}$$

$$e = \frac{-16+5}{2} = -\frac{11}{2}, f = \frac{10-3}{10} = \frac{7}{10}, \frac{e}{f} = \frac{-\frac{11}{2}}{\frac{7}{10}} = -\frac{11}{2} \times \frac{10}{7} = -\frac{110}{14} = -\frac{55}{7}$$

$$C = \frac{a}{b} \times \frac{c}{d} \times \frac{e}{f} = \left(\frac{2}{55}\right) \times \left(-\frac{28}{45}\right) \times \left(-\frac{55}{7}\right) = + \frac{2 \times 28 \times 55}{55 \times 45 \times 7}$$

$$= \frac{2 \times 4}{45 \times 1} = \boxed{\frac{8}{45}}$$

$$\text{نكتب } D = \frac{a}{b} \times \frac{c}{d} \times \frac{e}{f} \text{ حيث } a = \frac{11}{12} + \frac{1}{8}, b = 3 - \frac{3}{7}, c = -2 + \frac{2}{9}, d = \frac{5}{8} - \frac{3}{2}, e = 2 + \frac{3}{7}, f = 4 - \frac{2}{9}$$

$$\text{لدينا: } a = \frac{22+3}{24} = \frac{25}{24}, b = \frac{21-3}{7} = \frac{18}{7}, \frac{a}{b} = \frac{25}{24} \times \frac{7}{18} = \frac{175}{432}$$

$$c = \frac{-18+2}{9} = -\frac{16}{9}, d = \frac{5-9}{6} = -\frac{4}{6} = -\frac{2}{3}, \frac{c}{d} = +\frac{16}{9} \times \frac{3}{2} = \frac{8}{3}$$

$$e = \frac{14+3}{7} = \frac{17}{7}, f = \frac{36-2}{9} = \frac{34}{9}, \frac{e}{f} = \frac{17}{7} \times \frac{9}{34} = \frac{9}{7 \times 2} = \frac{9}{14}$$

$$D = \frac{a}{b} \times \frac{c}{d} \times \frac{e}{f} = \left(\frac{175}{432}\right) \times \left(\frac{8}{3}\right) \times \left(\frac{9}{14}\right) = \frac{25 \times 7}{8 \times 9 \times 6} \times \frac{8}{3} \times \frac{9}{2 \times 7} = \boxed{\frac{25}{36}}$$

وبالتالي:

$$\text{نكتب } A = \frac{\frac{a}{2} - \frac{b}{20}}{c} \text{ حيث } a = \frac{1}{4} + \frac{1}{5} + 5, b = 8 + \frac{2}{3} - \frac{1}{6}, c = \frac{13}{12} - \frac{5}{3} - 6$$

$$\text{لدينا: } a = \frac{1}{4} + \frac{1}{5} + 5 = \frac{1 \times 5}{4 \times 5} + \frac{1 \times 4}{5 \times 4} + \frac{5 \times 20}{20} = \frac{5}{20} + \frac{4}{20} + \frac{100}{20} = \frac{5+4+100}{20} = \frac{109}{20}$$

$$\frac{a}{2} = \frac{\frac{109}{20}}{2} = \frac{109}{20 \times 2} = \frac{109}{40}$$

$$b = 8 + \frac{2}{3} - \frac{1}{6} = \frac{8 \times 6}{1 \times 6} + \frac{2 \times 2}{3 \times 2} - \frac{1}{6} = \frac{48}{6} + \frac{4}{6} - \frac{1}{6} = \frac{48+4-1}{6} = \frac{51}{6} = \frac{17}{2}$$

$$\frac{b}{20} = \frac{\frac{17}{2}}{20} = \frac{17}{2 \times 20} = \frac{17}{40}$$

$$\frac{a}{2} - \frac{b}{20} = \frac{109}{40} - \frac{17}{40} = \frac{109-17}{40} = \frac{92}{40} = \frac{23 \times 4}{10 \times 4} = \frac{23 \times \cancel{4}}{10 \times \cancel{4}} = \frac{23}{10}$$

$$c = \frac{13}{12} - \frac{5}{3} - 6 = \frac{13}{12} - \frac{5 \times 4}{3 \times 4} - \frac{6 \times 12}{1 \times 12} = \frac{13}{12} - \frac{20}{12} - \frac{72}{12} = \frac{13-20-72}{12} = -\frac{79}{12}$$

$$A = \frac{\frac{a}{2} - \frac{b}{20}}{c} = \frac{\frac{23}{10}}{-\frac{79}{12}} = \frac{23}{10} \times \left(-\frac{12}{79}\right) = -\frac{23 \times 12}{10 \times 79} = -\frac{23 \times \cancel{12}^6}{10 \times 79 \times \cancel{10}^5} = -\frac{23 \times 6}{5 \times 79} = \boxed{-\frac{138}{395}}$$

بالتالي:

$$\text{نكتب } B = \frac{\frac{a}{6} - \frac{b}{10}}{c} \text{ حيث } a = 4 + \frac{1}{3} + \frac{1}{5}, b = 5 + \frac{5}{9} - \frac{4}{3}, c = -1 + \frac{1}{2} - \frac{3}{4}$$

$$\text{لدينا: } a = 4 + \frac{1}{3} + \frac{1}{5} = \frac{4 \times 15}{1 \times 15} + \frac{1 \times 5}{3 \times 5} + \frac{1 \times 3}{5 \times 3} = \frac{60}{15} + \frac{5}{15} + \frac{3}{15} = \frac{60+5+3}{15} = \frac{68}{15}$$

$$\frac{a}{6} = \frac{\frac{68}{15}}{6} = \frac{68}{15 \times 6} = \frac{34 \times 2}{15 \times 3 \times 2} = \frac{34 \times \cancel{2}}{45 \times \cancel{2}} = \frac{34}{45}$$

$$b = 5 + \frac{5}{9} - \frac{4}{3} = \frac{5 \times 9}{1 \times 9} + \frac{5}{9} - \frac{4 \times 3}{3 \times 3} = \frac{45}{9} + \frac{5}{9} - \frac{12}{9} = \frac{45+5-12}{9} = \frac{38}{9}$$

$$\frac{b}{10} = \frac{\frac{38}{9}}{10} = \frac{38}{9 \times 10} = \frac{38}{90} = \frac{19}{45}$$

$$\frac{a}{6} - \frac{b}{10} = \frac{34}{45} - \frac{19}{45} = \frac{34-19}{45} = \frac{15}{45} = \frac{\cancel{15}}{3 \times \cancel{15}} = \frac{1}{3}$$

$$B = \frac{2 \times 3^2 \times 7^4}{3 \times 4 \times 14} = \frac{\cancel{2} \times \cancel{3} \times 3 \times \cancel{7} \times 7^3}{\cancel{3} \times 4 \times \cancel{2} \times \cancel{7}} = \frac{3 \times 7^3}{4} = \boxed{\frac{1029}{4}}$$

10 أحسب ثم اختزل النتائج :

$$A = \left[\left(\frac{7}{8} - \frac{9}{16} - 13 \right) + \left(-\frac{5}{12} + \frac{4}{27} + 1 \right) \right] - \left[\left(\frac{9}{4} + \frac{1}{3} - 6 \right) - \left(\frac{1}{8} - \frac{1}{9} \right) \right]$$

$$B = \left(-\frac{7}{9} \right) \left[\left(3 + \frac{1}{4} - \frac{19}{5} \right) - \left(-\frac{2}{5} - \frac{3}{4} \right) \right] + \left(-\frac{1}{5} \right) \left[10 - 4 \left(\frac{1}{3} + 7 \right) \right]$$

نكتب $A = [a + b] - [c - d]$ حيث :

$$a = \frac{7}{8} - \frac{9}{16} - 13 = \frac{14}{16} - \frac{9}{16} - \frac{208}{16} = \frac{14 - 9 - 208}{16} = -\frac{203}{16}$$

$$b = -\frac{5}{12} + \frac{4}{27} + 1 = -\frac{45}{108} + \frac{16}{108} + \frac{108}{108} = \frac{-45 + 16 + 108}{108} = \frac{79}{108}$$

$$c = \frac{9}{4} + \frac{1}{3} - 6 = \frac{27}{12} + \frac{4}{12} - \frac{72}{12} = \frac{27 + 4 - 72}{12} = -\frac{41}{12}$$

$$d = \frac{1}{8} - \frac{1}{9} = \frac{9}{72} - \frac{8}{72} = \frac{1}{72}$$

$$A = \left[-\frac{203}{16} + \frac{79}{108} \right] - \left[-\frac{41}{12} - \frac{1}{72} \right] = -\frac{203}{16} + \frac{79}{108} + \frac{41}{12} + \frac{1}{72}$$

$$= \frac{-203 \times 27 + 79 \times 4 + 41 \times 36 + 1 \times 6}{432} = \boxed{-\frac{3683}{32}}$$

منه :

$$B = \left(-\frac{7}{9} \right) \left[\left(\frac{60}{20} + \frac{5}{20} - \frac{76}{20} \right) - \left(-\frac{8}{20} - \frac{15}{20} \right) \right] + \left(-\frac{1}{5} \right) \left[10 - 4 \left(\frac{1}{3} + \frac{21}{3} \right) \right]$$

$$= \left(-\frac{7}{9} \right) \left[\frac{60 + 5 - 76}{20} - \frac{-8 - 15}{20} \right] + \left(-\frac{1}{5} \right) \left[10 - 4 \left(\frac{1 + 21}{3} \right) \right]$$

$$= \left(-\frac{7}{9} \right) \left[-\frac{11}{20} + \frac{23}{20} \right] + \left(-\frac{1}{5} \right) \left[10 - 4 \times \frac{22}{3} \right]$$

$$= \left(-\frac{7}{9} \right) \left[\frac{-11 + 23}{20} \right] + \left(-\frac{1}{5} \right) \left[\frac{30}{3} - \frac{88}{3} \right]$$

$$= \left(-\frac{7}{9} \right) \left[\frac{12}{20} \right] + \left(-\frac{1}{5} \right) \left[\frac{30 - 88}{3} \right] = \left(-\frac{7}{9} \right) \left[\frac{3}{5} \right] + \left(-\frac{1}{5} \right) \left[-\frac{58}{3} \right]$$

$$= -\frac{7}{15} + \frac{58}{15} = \frac{-7 + 58}{15} = \frac{51}{15} = \boxed{\frac{17}{5}}$$

8 أحسب ثم اختزل النتائج :

$$a = \frac{2}{5} + \frac{3}{2}, \quad b = \frac{1}{21} - \frac{5}{6}, \quad c = \frac{1}{64} \times \frac{8}{3}, \quad d = \frac{7}{33} : \frac{21}{11}, \quad e = \frac{1}{2} + \frac{7}{10}, \quad f = \frac{1}{2} - \frac{7}{10}, \quad g = \frac{1}{2} \times \frac{7}{10}, \quad h = \frac{1}{2} : \frac{7}{10}$$

$$a = \frac{2}{5} + \frac{3}{2} = \frac{2 \times 2}{5 \times 2} + \frac{3 \times 5}{2 \times 5} = \frac{4}{10} + \frac{15}{10} = \frac{4 + 15}{10} = \boxed{\frac{19}{10}}$$

$$b = \frac{1}{21} - \frac{5}{6} = \frac{1 \times 2}{21 \times 2} - \frac{5 \times 7}{6 \times 7} = \frac{2}{42} - \frac{35}{42} = \frac{2 - 35}{42} = -\frac{33}{42} = -\frac{11 \times \cancel{3}}{14 \times \cancel{3}} = \boxed{-\frac{11}{14}}$$

$$c = \frac{1}{64} \times \frac{8}{3} = \frac{1 \times 8}{64 \times 3} = \frac{\overset{1}{\cancel{8}}}{\underset{\times 3}{\cancel{64}}} = \frac{1}{8 \times 3} = \boxed{\frac{1}{24}}$$

$$d = \frac{7}{33} : \frac{21}{11} = \frac{7}{33} \times \frac{11}{21} = \frac{7 \times 11}{33 \times 21} = \frac{\overset{1}{\cancel{7}} \times \overset{1}{\cancel{11}}}{\underset{\times 3}{\cancel{33}} \times \underset{\times 7}{\cancel{21}}} = \frac{1 \times 1}{3 \times 3} = \boxed{\frac{1}{9}}$$

$$e = \frac{1}{2} + \frac{7}{10} = \frac{1 \times 5}{2 \times 5} + \frac{7}{10} = \frac{5}{10} + \frac{7}{10} = \frac{5 + 7}{10} = \frac{12}{10} = \boxed{\frac{6}{5}}$$

$$f = \frac{1}{2} - \frac{7}{10} = \frac{1 \times 5}{2 \times 5} - \frac{7}{10} = \frac{5}{10} - \frac{7}{10} = \frac{5 - 7}{10} = -\frac{2}{10} = \boxed{-\frac{1}{5}}$$

$$g = \frac{1}{2} \times \frac{7}{10} = \frac{1 \times 7}{2 \times 10} = \boxed{\frac{7}{20}}$$

$$h = \frac{1}{2} : \frac{7}{10} = \frac{1}{2} \times \frac{10}{7} = \frac{1 \times 10}{2 \times 7} = \frac{\overset{5}{\cancel{10}}}{\underset{\times 7}{\cancel{2}}} = \frac{5 \times 1}{1 \times 7} = \boxed{\frac{5}{7}}$$

9 اختزل العوامل المشتركة و اكتب النتائج على أبسط شكل :

$$A = \frac{2^3 \times 7^2 \times 10^2}{2 \times 7^5 \times 10^3}, \quad B = \frac{2 \times 3^2 \times 7^4}{3 \times 4 \times 14}$$

$$A = \frac{\cancel{2} \times 2^2 \times \cancel{7}^2 \times \cancel{10}^2}{\cancel{2} \times \cancel{7}^2 \times 7^3 \times \cancel{10}^2 \times 10} = \frac{2^2}{7^3 \times 10} = \frac{\cancel{2} \times 2}{7^3 \times \cancel{2} \times 5} = \frac{2}{7^3 \times 5} = \boxed{\frac{2}{1715}}$$