

الدروس ① : جمع وطرح الأعداد الجزئية

I - مجموع وفرق عددين جزئيين:

(1) مثال: نشاط ① ص 29:

(4) العددين الجزئيين المتقابلين:

* تعريف:

إذا كان $\frac{a}{b} + \frac{-a}{b} = 0$ ، إذا كان $\frac{a}{b}$ عددا جزئيا فإنه،
 العدد الجزئي $\frac{-a}{b}$ يسمى متقابل العدد الجزئي $\frac{a}{b}$
 العدد الجزئي $\frac{a}{b}$ يسمى متقابل العدد الجزئي $\frac{-a}{b}$
 فتقول إن العددين الجزئيين $\frac{a}{b}$ و $\frac{-a}{b}$ متقابلان.

* أمثلة:

- متقابل العدد $\frac{5}{2}$ هو العدد $\frac{-5}{2}$
- متقابل العدد $\frac{22}{17}$ هو العدد $\frac{-22}{17}$
- متقابل العدد $\frac{9}{13}$ هو العدد $\frac{-9}{13}$
- متقابل العدد $\frac{-5}{11}$ هو العدد $\frac{5}{11}$

(5) قاعدة ترتيب جزيء مجموع:

* مثال:

$$\frac{2}{5} + \frac{1}{7} = \frac{14}{35} + \frac{5}{35} = \frac{14+5}{35} = \frac{9}{35}$$

* لاحظ أن:

$$\frac{2}{5} + \frac{1}{7} = \frac{2}{5} + \frac{2}{7} = \frac{2}{5} + \frac{2}{7}$$

* قاعدة ③:

* $\frac{5}{7} + \frac{8}{7} = \frac{5+8}{7} = \frac{13}{7}$

* $3 + \frac{10}{3} = \frac{9}{3} + \frac{10}{3} = \frac{9+10}{3} = \frac{19}{3}$

* $2\frac{7}{6} + \frac{7}{6} = \frac{27}{6} + \frac{7}{6} = \frac{81}{60} + \frac{21}{60} = \frac{81+21}{60} = \frac{102}{60} = \frac{17 \times 6}{5 \times 6} = \frac{17}{5}$

$\frac{2}{3} - \frac{1}{4} = \frac{2}{3} - \frac{1}{4} = \frac{20}{30} - \frac{7}{30} = \frac{20-7}{30} = \frac{13}{30}$

$\frac{3}{16} - \frac{1}{4} = \frac{3}{16} - \frac{4}{16} = \frac{3-4}{16} = \frac{-1}{16}$

$\frac{7}{12} + \frac{17}{144} = \frac{84}{144} + \frac{17}{144} = \frac{84+17}{144} = \frac{101}{144}$

(2) قاعدة ②: جمع عددين جزئيين

$$\frac{a}{b} + \frac{c}{b} = \frac{a+c}{b}$$

* أمثلة:

* $\frac{2}{5} + \frac{-11}{5} = \frac{2+(-11)}{5} = \frac{-9}{5}$

* $\frac{3}{7} + \frac{5}{7} = \frac{-3+5}{7} = \frac{2}{7}$

* $\frac{-3}{6} - \frac{5}{6} = \frac{-3-5}{6} = \frac{-8}{6} = \frac{-4}{3}$

* $\frac{6}{11} - \frac{-5}{11} = \frac{6-(-5)}{11} = \frac{6+5}{11} = \frac{11}{11} = 1$

(3) قاعدة ③:

قاعدة:

$$\frac{a}{b} + \frac{c}{d} = \frac{ad+bc}{bd}$$

$$\frac{a}{b} - \frac{c}{d} = \frac{ad-bc}{bd}$$

لا يتغير مجموع عددين جزئيين إذا غيرنا ترتيب جزيئيهما

حدود. بتعبير آخر $\frac{a}{b}$ و $\frac{x}{y}$ عددين جزئيين

$$\frac{a}{b} + \frac{x}{y} = \frac{x}{y} + \frac{a}{b}$$

(6) تجربة تطبيعية: تمرين 3 ص 26:

* $\frac{3}{28} + \frac{-4}{7} = \frac{3}{28} + \frac{-16}{28} = \frac{3-16}{28} = \frac{-13}{28}$

$\frac{-17}{30} + \frac{1}{6} = \frac{-17}{30} + \frac{5}{30} = \frac{-17+5}{30} = \frac{-12}{30} = \frac{-2}{5}$

$\frac{-5}{13} + \left(\frac{-17}{52}\right) = \frac{-20}{52} + \frac{-17}{52} = \frac{-20-17}{52} = \frac{-37}{52}$

$\frac{13}{27} + \frac{5}{9} = \frac{13}{27} + \frac{15}{27} = \frac{13+15}{27} = \frac{28}{27}$

$\frac{9}{-14} + \frac{31}{42} = \frac{-27}{42} + \frac{31}{42} = \frac{-27+31}{42} = \frac{4}{42} = \frac{2}{21}$

* $\frac{3}{5} + \frac{-4}{3} = \frac{3 \times 3}{5 \times 3} + \frac{5 \times (-4)}{5 \times 3} = \frac{9}{15} + \frac{-20}{15} = \frac{9-20}{15} = \frac{-11}{15}$

* $\frac{-7}{8} - \frac{5}{12} = \frac{-21}{24} - \frac{10}{24} = \frac{-21-10}{24} = \frac{-31}{24}$

* $\frac{6}{-7} + \frac{11}{14} = \frac{-12}{14} + \frac{11}{14} = \frac{-12+11}{14} = \frac{-1}{14}$

$$\frac{7}{12} + \frac{25}{-36} = \frac{21}{36} + \frac{-25}{36} = \frac{21 + (-25)}{36} = \frac{-4}{36} = -\frac{1}{9}$$

II - جمع ثلاث أعداد جزئية:

(1) مثال: $\left(\frac{1}{2} + \frac{-1}{4}\right) + \frac{-1}{3}$: حسب ما يلي :
 : $\frac{1}{2} \rightarrow \frac{3}{6}$: $\frac{-1}{4} \rightarrow \frac{-2}{4}$

$$\begin{aligned} * \left(\frac{1}{2} + \frac{-1}{4}\right) + \frac{-1}{3} &= \left(\frac{3}{6} + \frac{-2}{6}\right) + \frac{-1}{4} & \text{الحل} \\ &= \frac{3 + (-2)}{6} + \frac{-1}{4} = \frac{1}{6} + \frac{-1}{4} \\ &= \frac{2}{12} + \frac{-3}{12} = \frac{-1}{12} \end{aligned}$$

$$\begin{aligned} * \left(\frac{1}{2} + \frac{-1}{4}\right) + \frac{-1}{3} &= \left(\frac{2}{4} + \frac{-1}{4}\right) + \frac{-1}{3} \\ &= \frac{2 + (-1)}{4} + \frac{-1}{3} = \frac{1}{4} + \frac{-1}{3} = \frac{3}{12} + \frac{-4}{12} \\ &= \frac{-1}{12} \end{aligned}$$

$$\left(\frac{1}{2} + \frac{-1}{4}\right) + \frac{-1}{3} = \left(\frac{1}{2} + \frac{-1}{3}\right) + \frac{-1}{4} : \text{مثال (2)}$$

(2) أمثلة 4 و 5

$$\begin{aligned} a + b + c &= (a + b) + c \\ &= a + (b + c) \\ &= (a + c) + b \end{aligned}$$

: a, b, c أعداد جزئية

$$\begin{aligned} * \frac{2}{5} + \frac{1}{3} + \frac{4}{5} &= \left(\frac{2}{5} + \frac{4}{5}\right) + \frac{1}{3} & \text{مثال (3)} \\ &= \frac{2+4}{5} + \frac{1}{3} = \frac{6}{5} + \frac{1}{3} = \frac{6 \times 3}{15} + \frac{5}{15} = \frac{18+5}{15} \\ &= \frac{23}{15} \end{aligned}$$

$$\begin{aligned} * \frac{5}{3} + \frac{7}{3} - \frac{1}{9} &= \frac{-5+7}{3} - \frac{1}{9} \\ &= \frac{2}{3} - \frac{1}{9} = \frac{6}{9} - \frac{1}{9} = \frac{6-1}{9} = \frac{5}{9} \end{aligned}$$

$$\begin{aligned} * \frac{8}{3} - \frac{3}{10} + \frac{1}{10} &= \frac{8}{3} + \left(\frac{-3}{10} + \frac{1}{10}\right) \\ &= \frac{8}{3} + \frac{-3+1}{10} \\ &= \frac{8}{3} + \frac{-2}{10} \\ &= \frac{80}{30} + \frac{-6}{30} \\ &= \frac{74}{30} = \frac{2 \times 37}{2 \times 15} = \frac{37}{15} \end{aligned}$$