

I - جمع وفراغ عددين جزئيين :

(1) مثال : نشاط ① ص 29 :

(4) العددين الجزئيين المتقابلين :

* تعريف :

إذا كان $\frac{a}{b} + \frac{-a}{b} = 0$ ، عدد جزئيا مقلبا ،
 العدد الجزئي $\frac{-a}{b}$ يسمى متقابل العدد الجزئي $\frac{a}{b}$
 العدد الجزئي $\frac{a}{b}$ يسمى متقابل العدد الجزئي $\frac{-a}{b}$
 فنقول (أي 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 جدوى مجموع :

* مثال :
 $\frac{2}{5} + \frac{-1}{7} = \frac{14}{35} + \frac{-5}{35} = \frac{14+(-5)}{35} = \frac{9}{35}$
 لاحظ أن : $\frac{2}{5} + \frac{-1}{7} = \frac{-1}{7} + \frac{2}{5} = \frac{-5}{35} + \frac{14}{35} = \frac{-5+14}{35} = \frac{9}{35}$
 قاعدة ③ :

لا يتغير مجموع عددين جزئيين إذا غيرنا ترتيب

حدوده. بتعبير آخر : $\frac{a}{b} + \frac{x}{y} = \frac{x}{y} + \frac{a}{b}$ عددين جزئيين

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

(6) تجربة تجريبية : تمرين 3 ص 36 :

* $\frac{3}{28} + \frac{-4}{7} = \frac{3}{28} + \frac{4}{7} = \frac{3}{28} + \frac{16}{28} = \frac{3+16}{28} = \frac{19}{28}$
 $\frac{-17}{30} + \frac{1}{6} = \frac{-17}{30} + \frac{5}{30} = \frac{-17+5}{30} = \frac{-12}{30} = \frac{-2}{5}$
 $\frac{-5}{13} + \left(\frac{-17}{52}\right) = \frac{-20}{52} + \frac{-17}{52} = \frac{-20+(-17)}{52} = \frac{-37}{52}$
 $\frac{-13}{27} + \frac{5}{9} = \frac{-13}{27} + \frac{15}{27} = \frac{-13+15}{27} = \frac{2}{27}$
 $\frac{9}{-14} + \frac{31}{42} = \frac{-27}{42} + \frac{31}{42} = \frac{-27+31}{42} = \frac{4}{42} = \frac{2}{21}$

* $\frac{5}{7} + \frac{8}{7} = \frac{5+8}{7} = \frac{13}{7}$
 * $3 + \frac{10}{3} = \frac{9}{3} + \frac{10}{3} = \frac{9+10}{3} = \frac{19}{3}$
 $\frac{27}{10} + \frac{7}{6} = \frac{27}{10} + \frac{7}{6} = \frac{81}{30} + \frac{35}{30} = \frac{81+35}{30} = \frac{116}{30} = \frac{58}{15}$
 $\frac{2}{3} - \frac{1}{4} = \frac{2}{3} - \frac{1}{4} = \frac{20}{30} - \frac{7.5}{30} = \frac{20-21}{30} = \frac{-1}{30}$
 $\frac{3}{16} - \frac{1}{4} = \frac{3}{16} - \frac{4}{16} = \frac{3-4}{16} = \frac{-1}{16}$
 $\frac{7}{12} + \frac{17}{144} = \frac{84}{144} + \frac{17}{144} = \frac{84+17}{144} = \frac{101}{144}$

(2) قاعدة جدوى جزئيات :

$$\frac{a}{b} - \frac{c}{b} = \frac{a-c}{b} \quad , \quad \frac{a}{b} + \frac{c}{b} = \frac{a+c}{b}$$

* أمثلة :

* $\frac{2}{5} + \frac{-11}{5} = \frac{2+(-11)}{5} = \frac{-9}{5}$
 * $\frac{3}{7} + \frac{5}{7} = \frac{-3}{7} + \frac{5}{7} = \frac{(-3)+5}{7} = \frac{2}{7}$
 * $\frac{-3}{6} - \frac{5}{6} = \frac{-3}{6} - \frac{5}{6} = \frac{(-3)-5}{6} = \frac{-8}{6} = \frac{-4}{3}$
 * $\frac{6}{11} - \frac{-5}{11} = \frac{6-(-5)}{11} = \frac{6+5}{11} = \frac{11}{11} = 1$

(3) قاعدة ③ :

قاعدة :

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

* أمثلة :

* $\frac{3}{5} + \frac{-4}{3} = \frac{3 \times 3}{5 \times 3} + \frac{5 \times (-4)}{5 \times 3} = \frac{9}{15} + \frac{-20}{15} = \frac{9+(-20)}{15} = \frac{-11}{15}$
 * $\frac{-7}{8} - \frac{5}{12} = \frac{-21}{24} - \frac{10}{24} = \frac{-21-10}{24} = \frac{-31}{24}$
 * $\frac{6}{-7} + \frac{11}{14} = \frac{-12}{14} + \frac{11}{14} = \frac{-12+11}{14} = \frac{-1}{14}$

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

II - مجموع ثلاث أعداد حشرية:

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

الحل:
 * $\left(\frac{1}{2} + \frac{-1}{4}\right) + \frac{-1}{3} = \left(\frac{2}{4} + \frac{-1}{4}\right) + \frac{-1}{3} = \frac{2 + (-1)}{4} + \frac{-1}{3} = \frac{1}{4} + \frac{-1}{3} = \frac{3}{12} + \frac{-4}{12} = \frac{-1}{12}$

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

(2) ما إذا كان : $\left(\frac{1}{2} + \frac{-1}{4}\right) + \frac{-1}{3} = \left(\frac{1}{2} + \frac{-1}{3}\right) + \frac{-1}{4}$

(2) قاعدة 4:
 $a + b + c = (a + b) + c$: حيث a, b, c أعداد حشرية
 $= a + (b + c)$
 $= (a + c) + b$

(3) مثال:
 * $\frac{2}{5} + \frac{1}{3} + \frac{4}{5} = \left(\frac{2}{5} + \frac{4}{5}\right) + \frac{1}{3} = \frac{2+4}{5} + \frac{1}{3} = \frac{6}{5} + \frac{1}{3} = \frac{6 \times 3}{15} + \frac{1 \times 5}{15} = \frac{18+5}{15} = \frac{23}{15}$

* $\frac{-5}{3} + \frac{7}{3} - \frac{1}{9} = \frac{-5+7}{3} - \frac{1}{9} = \frac{2}{3} - \frac{1}{9} = \frac{2 \times 3}{9} - \frac{1}{9} = \frac{6-1}{9} = \frac{5}{9}$

* $\frac{8}{3} - \frac{3}{10} + \frac{1}{10} = \frac{8}{3} + \left(\frac{-3}{10} + \frac{1}{10}\right) = \frac{8}{3} + \frac{-3+1}{10} = \frac{8}{3} + \frac{-2}{10} = \frac{8}{3} + \frac{-1}{5} = \frac{8 \times 5}{30} + \frac{-1 \times 6}{30} = \frac{40-6}{30} = \frac{34}{30} = \frac{17}{15}$