



# B1 2-3 分數的四則運算



概念

## ① 負分數

<p>① 負分數</p>	<p>② 等值分數</p>	<p>☆筆記</p>
<p>③ 約分和擴分</p>	<p>④ 最簡分數</p>	



## 牛刀小試 1

1. 請寫出等值分數

$$(1) -\frac{4}{20} = -\frac{\square}{10} = \frac{1}{\square} = \frac{\square}{30}$$

$$(2) -\frac{3}{7} = \frac{12}{\square} = \frac{\square}{35} = -\frac{27}{\square}$$

$$(3) -\frac{\square}{24} = -\frac{12}{8} = \frac{\square}{32} = -\frac{144}{\square}$$

$$(4) -\frac{30}{6} = \frac{60}{\square} = -\frac{\square}{1} = \frac{-25}{\square}$$

2. 請將下列題目進行約分，直到最簡分數

$$(1) -\frac{42}{192}$$

$$(2) -\frac{144}{108}$$

$$(3) -\frac{24}{84}$$

$$(4) \frac{-225}{-18}$$



## 例題 ① 化為最簡分數



①  $-\frac{6}{4}$

②  $-0.25$

③  $(-8) \div 6$

☆筆記



## 牛刀小試 2

將下列各題化為最簡分數：

1.  $-\frac{25}{20}$

2.  $-0.75$

3.  $\frac{3}{-15}$

4.  $(-14) \div 21$

5.  $1.25$

6.  $-\frac{375}{1000}$

7.  $-2\frac{25}{45}$

8.  $81 \div (-45)$



概念

## ② 分數的比大小



## ① 真分數

(1) 分母通分

$$\frac{1}{2}, \frac{2}{3}, \frac{3}{5}$$

(2) 分子通分

$$\frac{1}{71}, \frac{2}{81}, \frac{3}{91}$$

☆筆記

## ② 假分數

$$\frac{4}{3}, \frac{5}{4}, \frac{6}{5}$$

## ③ 負分數

$$-\frac{2}{5}, -\frac{3}{5}, -\frac{4}{5}$$



## 牛刀小試 3

比較下列各數大小：

1.  $\frac{1}{5}, \frac{2}{3}, \frac{3}{7}$

2.  $\frac{3}{4}, \frac{3}{5}, \frac{2}{3}$

3.  $\frac{7}{12}, \frac{13}{24}, \frac{25}{48}$

4.  $\frac{3}{4}, \frac{5}{6}, \frac{7}{8}$

5.  $-\frac{2}{7}, -\frac{3}{7}, -\frac{4}{7}$

6.  $-\frac{1}{2}, -\frac{1}{3}, -\frac{3}{5}$

7.  $-\frac{6}{5}, -\frac{4}{3}, -\frac{8}{7}$

8.  $-\frac{17}{15}, -\frac{15}{13}, -\frac{19}{17}$



## 例題 ② 負分數比大小



① (1)  $-\frac{1}{2}$ ,  $-\frac{1}{3}$ ,  $-\frac{1}{4}$

(2)  $|\frac{1}{2}|$ ,  $|\frac{1}{3}|$ ,  $|\frac{1}{4}|$

② (1)  $-\frac{6}{5}$ ,  $-\frac{7}{5}$ ,  $-\frac{8}{5}$

(2)  $|\frac{6}{5}|$ ,  $|\frac{7}{5}|$ ,  $|\frac{8}{5}|$

☆筆記



### 牛刀小試 4

比較下列各數大小：

1. (1)  $-\frac{1}{4}$ ,  $-\frac{1}{6}$ ,  $-\frac{1}{12}$

(2)  $|\frac{1}{4}|$ ,  $|\frac{1}{6}|$ ,  $|\frac{1}{12}|$

2. (1)  $-\frac{8}{7}$ ,  $-\frac{9}{7}$ ,  $-\frac{10}{7}$

(2)  $|\frac{8}{7}|$ ,  $|\frac{9}{7}|$ ,  $|\frac{10}{7}|$

3. (1)  $-\frac{4}{13}$ ,  $-\frac{4}{14}$ ,  $-\frac{4}{15}$

(2)  $|\frac{4}{13}|$ ,  $|\frac{4}{14}|$ ,  $|\frac{4}{15}|$

4. (1)  $-\frac{4}{7}$ ,  $-\frac{7}{7}$ ,  $-\frac{9}{7}$

(2)  $|\frac{4}{7}|$ ,  $|\frac{7}{7}|$ ,  $|\frac{9}{7}|$



概念

### ③ 分數的加減法



①  $(-\frac{2}{7}) + (-\frac{3}{7})$

②  $-\frac{9}{5} - (-\frac{4}{5})$

☆筆記  
負號的位置



### 牛刀小試 5

1.  $(-\frac{2}{5}) + (-\frac{7}{5})$

2.  $(-\frac{4}{11}) + \frac{7}{11}$

3.  $-\frac{5}{13} - (-\frac{7}{13})$

4.  $\frac{-12}{7} - (-\frac{3}{7})$

5.  $(-\frac{10}{17}) - (-\frac{25}{17})$

6.  $(-\frac{21}{15}) + (\frac{-9}{15})$

7.  $(-\frac{2}{5}) - \frac{3}{5}$

8.  $(-\frac{3}{16}) - \frac{11}{16}$

**例題****③****分數加減法練習**

**①**  $-\frac{1}{3} - (-\frac{3}{5})$

**②**  $\frac{7}{4} + (-\frac{11}{6})$

☆筆記

**牛刀小試****6**

**1.**  $(-\frac{2}{3}) + (-\frac{7}{5})$

**5.**  $(-\frac{3}{2}) - \frac{7}{3}$

**2.**  $(-\frac{3}{7}) + (-\frac{4}{9})$

**6.**  $(-\frac{16}{3}) - (-\frac{9}{4})$

**3.**  $(-\frac{5}{2}) + \frac{8}{5}$

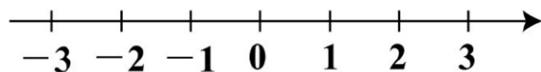
**7.**  $\frac{6}{7} - (-\frac{12}{11})$

**4.**  $-\frac{5}{11} - (-\frac{2}{5})$

**8.**  $-\frac{1}{25} - \frac{1}{4}$



$-2\frac{1}{3}$  是什麼意思呢？請在數線上標出來。



❶  $-2 + \frac{1}{3}$

❷  $-2 - \frac{1}{3}$

❸  $-(2 + \frac{1}{3})$

☆筆記



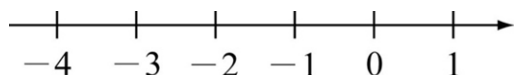
### 牛刀小試 7

請選出正確的答案，並在數線上標示出來。

1.  $-3\frac{2}{5} = ?$

(1)  $-3 - \frac{2}{5}$                       (2)  $-3 + \frac{2}{5}$

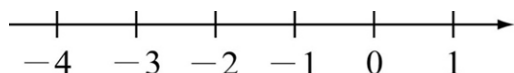
(3)  $-(3 + \frac{2}{5})$                       (4)  $-4 + \frac{3}{5}$



2.  $-\frac{1}{4} = ?$

(1)  $-1 + \frac{1}{4}$                       (2)  $0 - \frac{1}{4}$

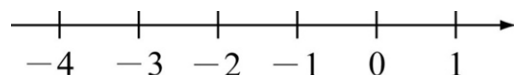
(3)  $-1 - \frac{1}{4}$                       (4)  $-(0 + \frac{1}{4})$



3.  $-1\frac{2}{3} = ?$

(1)  $-1 + \frac{2}{3}$                       (2)  $-2 + \frac{1}{3}$

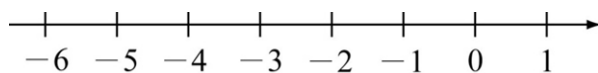
(3)  $-1 - \frac{2}{3}$                       (4)  $-(1 + \frac{2}{3})$



4.  $-5\frac{4}{7} = ?$

(1)  $-5 - \frac{4}{7}$                       (2)  $-5 + \frac{4}{7}$

(3)  $-(5 + \frac{4}{7})$                       (4)  $-6 + \frac{3}{7}$



**例題****4****帶分數的加減**

$$1\frac{5}{12} - 2\frac{1}{6} - (-\frac{2}{3})$$

☆筆記

**牛刀小試 8**

1.  $-3\frac{5}{6} - (-1\frac{7}{12})$

2.  $(-2\frac{1}{3}) + 1\frac{3}{4}$

3.  $(-5\frac{1}{3}) - 1\frac{1}{2}$

4.  $-6\frac{5}{6} + (-2\frac{1}{5}) + 3\frac{3}{15}$

5.  $\frac{4}{3} - (-\frac{5}{12}) - (-\frac{7}{6})$

6.  $(-\frac{4}{5}) + 8 - 2\frac{1}{3} - (-\frac{4}{5})$





概念

## 5 分數的乘法



①  $(-\frac{5}{3}) \times \frac{1}{2}$

②  $(-1\frac{1}{4}) \times (-\frac{2}{5})$

☆筆記



### 牛刀小試 9

1.  $(-\frac{7}{3}) \times \frac{15}{28}$

4.  $(-11\frac{1}{3}) \times (-4\frac{1}{17})$

2.  $(-\frac{46}{11}) \times \frac{22}{23}$

5.  $(-\frac{25}{23}) \times (-\frac{46}{35})$

3.  $(-\frac{17}{5}) \times (-\frac{5}{2})$

6.  $(-3\frac{4}{7}) \times (-2\frac{6}{25})$



## 例題 5 多個分數相乘



①  $\left[ \left( -\frac{15}{97} \right) \times \frac{8}{25} \right] \times \left( -\frac{97}{6} \right)$

②  $\left( -1\frac{1}{2} \right) \times \left( -1\frac{2}{3} \right) \times \left( -1\frac{3}{4} \right)$

☆筆記

①交換律

②結合律



## 牛刀小試 10

1.  $\left[ \left( -\frac{39}{49} \right) \times \left( -\frac{14}{27} \right) \right] \times \left( -\frac{42}{26} \right)$

4.  $\left( -3\frac{1}{6} \right) \times \left( -1\frac{1}{5} \right) \times \left( -2\frac{1}{2} \right)$

2.  $\left( -\frac{4}{5} \right) \times \left[ \frac{9}{8} \times (-5) \right]$

5.  $\left( -2\frac{4}{21} \right) \times \left( -3\frac{1}{23} \right) \times \left( -\frac{3}{10} \right)$

3.  $\left( -\frac{5}{9} \right) \times \left[ \left( -\frac{25}{18} \right) \times \left( -\frac{81}{5} \right) \right]$

6.  $\left( -2\frac{2}{3} \right) \times \left( -3\frac{3}{5} \right) \times \left( -\frac{5}{7} \right)$



## ① 倒數

2 的倒數是\_\_\_\_\_

 $\frac{3}{4}$  的倒數是\_\_\_\_\_

-7 的倒數是\_\_\_\_\_

 $1\frac{3}{5}$  的倒數是\_\_\_\_\_ $-1\frac{3}{5}$  的倒數是\_\_\_\_\_

## ② 分數的除法

$$(-\frac{5}{6}) \div \frac{2}{3} = ?$$

## ☆筆記

① 0 的倒數？

② 符號



## 牛刀小試 11

## 1. 寫出下列各數的倒數

(1)  $\frac{1}{3}$  的倒數是\_\_\_\_\_

(2) 1 的倒數是\_\_\_\_\_

(3)  $-\frac{2}{5}$  的倒數是\_\_\_\_\_(4)  $4\frac{2}{5}$  的倒數是\_\_\_\_\_

(5) -5 的倒數是\_\_\_\_\_

2.  $(-\frac{5}{6}) \div \frac{1}{18}$

3.  $(-\frac{7}{13}) \div (-\frac{7}{65})$

4.  $(-4) \div (-4\frac{1}{4})$

5.  $(-\frac{7}{9}) \div (-\frac{1}{3})$

6.  $1 \div (-\frac{3}{4})$



## 例題 ⑥ 分數的除法練習



① $\frac{3}{2} \div (-4)$	② $(-3) \div (-1\frac{2}{3})$	③ $(-\frac{4}{3}) \div 1\frac{1}{2} \div (2\frac{2}{3})$	☆筆記



### 牛刀小試 12

1.  $\frac{12}{5} \div (-6)$

4.  $(-\frac{27}{8}) \div (-\frac{9}{16})$

2.  $(-\frac{24}{7}) \div (-8)$

5.  $(-2\frac{2}{3}) \div (-1\frac{2}{3}) \div (-\frac{1}{6})$

3.  $(-\frac{24}{7}) \div \frac{3}{14}$

6.  $(-3\frac{9}{14}) \div (-4\frac{4}{7}) \div (-2\frac{1}{8})$



## ① 原則

(1) 先 $\otimes \oplus$ 後 $\oplus \ominus$ (2) 和先算(3) (      )  $\rightarrow$  [      ]  $\rightarrow$  {      }(4) 只有 $\otimes \oplus \Rightarrow$  

(5) 分數和小數互換

(6) 

## ② 分數和小數互換

$$\frac{1}{2} =$$

$$\frac{1}{4} =$$

$$\frac{1}{5} =$$

$$\frac{1}{8} =$$

## ☆筆記

分數和小數的互換

① 加減

 $\Rightarrow$ 化成 

② 乘除

 $\Rightarrow$ 化成 

③ 混合

 $\Rightarrow$ 化成 

## 牛刀小試 13

1. 將下列分數轉換為小數：

(1)  $\frac{1}{100}$

(2)  $\frac{1}{10}$

(3)  $\frac{1}{25}$

(4)  $\frac{3}{4}$

2. 將下列小數轉換為分數並化簡：

(1) 0.2

(2) 0.25

(3) 0.8

(4) 0.125

3. 請計算下列各題

(1)  $1\frac{2}{5} + 0.3$

(2)  $3\frac{1}{4} - 0.4$

(3)  $\frac{1}{7} \times 0.25$

(4)  $\frac{1}{2} \div 0.8$



## 例題 7 四則運算練習



①  $(-\frac{3}{4} + 0.7 \div \frac{2}{5}) \times (-0.6)$

②  $(-\frac{9}{7}) \times (-3\frac{1}{5}) + (-\frac{9}{7}) \times 3\frac{1}{5}$

☆筆記  
分配律：



### 牛刀小試 14

1.  $(-\frac{4}{5} + 0.7 \div \frac{3}{10}) \times 15$

4.  $\frac{7}{10} \times (-1\frac{3}{8}) + (-0.2) \times (-1\frac{3}{8})$

2.  $(-0.25 - \frac{1}{2} \div \frac{2}{5}) \times \frac{2}{3}$

5.  $-\frac{1}{3} \times \frac{6}{7} - \frac{6}{7} \times \frac{2}{3}$

3.  $5 - 0.3 \times \frac{7}{3} \div 0.2$

6.  $\frac{76}{123} \times (-\frac{4}{5}) - (-\frac{47}{123}) \times (-\frac{4}{5})$



# 解 答 篇

## 牛刀小試 1

- (1)  $2; -5; -6$   
(2)  $-28; -15; 63$   
(3)  $36; -48; 96$   
(4)  $-12; 5; 5$

- (1)  $-\frac{7}{32}$  (2)  $-\frac{4}{3}$   
(3)  $-\frac{2}{7}$  (4)  $\frac{25}{2}$

## 牛刀小試 2

- $-\frac{5}{4}$  (2)  $-\frac{3}{4}$   
(3)  $-\frac{1}{5}$  (4)  $-\frac{2}{3}$   
(5)  $\frac{5}{4}$  (6)  $-\frac{3}{8}$

- $-2\frac{5}{9}$  (8)  $-\frac{9}{5}$

## 牛刀小試 3

- $\frac{2}{3} > \frac{3}{7} > \frac{1}{5}$   
(2)  $\frac{3}{4} > \frac{2}{3} > \frac{3}{5}$   
(3)  $\frac{7}{12} > \frac{13}{24} > \frac{25}{48}$   
(4)  $\frac{7}{8} > \frac{5}{6} > \frac{3}{4}$   
(5)  $-\frac{2}{7} > -\frac{3}{7} > -\frac{4}{7}$   
(6)  $-\frac{1}{3} > -\frac{1}{2} > -\frac{3}{5}$   
(7)  $-\frac{8}{7} > -\frac{6}{5} > -\frac{4}{3}$

- $-\frac{19}{17} > -\frac{17}{15} > -\frac{15}{13}$

## 牛刀小試 4

- (1)  $-\frac{1}{12} > -\frac{1}{6} > -\frac{1}{4}$   
(2)  $|\frac{1}{4}| > |\frac{1}{6}| > |\frac{1}{12}|$   
(2)  $-\frac{8}{7} > -\frac{9}{7} > -\frac{10}{7}$   
(2)  $|\frac{10}{7}| > |\frac{9}{7}| > |\frac{8}{7}|$   
(3) (1)  $-\frac{4}{15} > -\frac{4}{14} > -\frac{4}{13}$   
(2)  $|\frac{4}{13}| > |\frac{4}{14}| > |\frac{4}{15}|$   
(4) (1)  $-\frac{4}{7} > -\frac{7}{7} > -\frac{9}{7}$   
(2)  $|\frac{9}{7}| > |\frac{7}{7}| > |\frac{4}{7}|$

## 牛刀小試 5

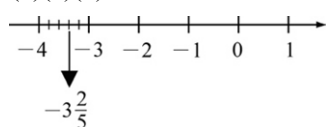
- $-\frac{9}{5}$  (2)  $\frac{3}{11}$   
(3)  $\frac{2}{13}$  (4)  $-\frac{9}{7}$   
(5)  $\frac{15}{17}$  (6)  $-2$   
(7)  $-1$  (8)  $-\frac{7}{8}$

## 牛刀小試 6

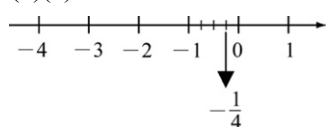
- $-\frac{31}{15}$  (2)  $-\frac{55}{63}$   
(3)  $-\frac{9}{10}$  (4)  $-\frac{3}{55}$   
(5)  $-\frac{23}{6}$  (6)  $-\frac{37}{12}$   
(7)  $\frac{150}{77}$  (8)  $-\frac{29}{100}$

## 牛刀小試 7

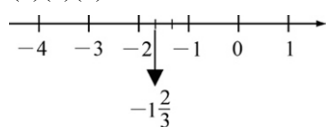
- (1)(3)(4)



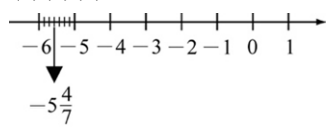
- (2)(4)



- (2)(3)(4)



- (1)(3)(4)



## 牛刀小試 8

- $-\frac{9}{4}$  (2)  $-\frac{7}{12}$   
(3)  $-\frac{41}{6}$  (4)  $-\frac{35}{6}$   
(5)  $\frac{35}{12}$  (6)  $5\frac{2}{3}$

## 牛刀小試 9

- $-\frac{5}{4}$  (2)  $-4$   
(3)  $\frac{17}{2}$  (4)  $46$   
(5)  $\frac{10}{7}$  (6)  $8$

## 牛刀小試 10

- $-\frac{2}{3}$  (2)  $\frac{9}{2}$   
(3)  $-\frac{25}{2}$  (4)  $-\frac{19}{2}$   
(5)  $-2$  (6)  $-\frac{48}{7}$

## 牛刀小試 11

- (1)  $3$  (2)  $1$   
(3)  $-\frac{5}{2}$  (4)  $\frac{5}{22}$   
(5)  $-\frac{1}{5}$   
(2)  $-15$   
(3)  $5$   
(4)  $\frac{16}{17}$   
(5)  $\frac{7}{3}$   
(6)  $-\frac{4}{3}$

## 牛刀小試 12

- $-\frac{2}{5}$   
(2)  $\frac{3}{7}$   
(3)  $-16$   
(4)  $6$   
(5)  $-\frac{48}{5}$   
(6)  $-\frac{3}{8}$

## 牛刀小試 13

- (1)  $0.01$  (2)  $0.1$   
(3)  $0.04$  (4)  $0.75$   
(2) (1)  $\frac{1}{5}$  (2)  $\frac{1}{4}$   
(3)  $\frac{4}{5}$  (4)  $\frac{1}{8}$   
(3) (1)  $1.7$  (2)  $2.85(2\frac{17}{20})$   
(3)  $\frac{1}{28}$  (4)  $\frac{5}{8}$

## 牛刀小試 14

- $23$  (2)  $-1$   
(3)  $\frac{3}{2}$  (4)  $-\frac{11}{16}$   
(5)  $-\frac{6}{7}$  (6)  $-\frac{4}{5}$