

# 3

# Fractions and Decimals

## Let's Review

### 1. Fraction

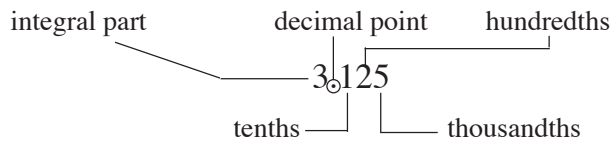
Fractions are numbers written in the form  $\frac{a}{b}$ .  
← numerator  
← denominator

- (a) Proper fraction – The numerator is smaller than the denominator, e.g.  $\frac{2}{5}$ ,  $\frac{6}{11}$
- (b) Improper fraction – The numerator is greater than the denominator, e.g.  $\frac{4}{3}$ ,  $\frac{23}{7}$
- (c) Mixed fraction – Number with an integer and fraction, e.g.  $1\frac{1}{3}$ ,  $2\frac{1}{7}$

### 2. Simplification of Fraction

e.g.  $\frac{48}{72} = \frac{48 \div 24}{72 \div 24} = \frac{2}{3}$  (It is the simplest form since 2 and 3 have no common factor.)

### 3. Decimal



e.g. 1.4, 3.67

### 4. Conversion between Fractions and Decimals

(a) Decimals to fractions

e.g.  $0.25 = \frac{25}{100} = \frac{1}{4}$

(b) Fractions to decimals

e.g.  $\frac{1}{20} = 0.05$

$$3.55 = 3\frac{55}{100} = 3\frac{11}{20}$$

$$\frac{13}{25} = 0.52$$

## 5. Arithmetic Operations of Fraction

(a) Addition

$$\begin{aligned} \text{e.g. } & \frac{2}{5} + \frac{3}{4} \\ &= \frac{8}{20} + \frac{15}{20} \quad (\text{L.C.M. of 5 and 4 is 20.}) \\ &= \frac{23}{20} \\ &= 1\frac{3}{20} \quad (\text{Change the improper fraction to mixed fraction}) \end{aligned}$$

(b) Subtraction

$$\begin{aligned} \text{e.g. } & 2\frac{1}{4} - 1\frac{5}{6} \\ &= \frac{9}{4} - \frac{11}{6} \quad (\text{Change the mixed fractions to improper fractions}) \\ &= \frac{27}{12} - \frac{22}{12} \quad (\text{L.C.M. of 4 and 6 is 12.}) \\ &= \frac{5}{12} \end{aligned}$$

(c) Multiplication

$$\begin{aligned} \text{e.g. } & 2\frac{2}{5} \times 1\frac{2}{3} \\ &= \frac{12}{5} \times \frac{5}{3} \quad (\text{Change the mixed fractions to improper fractions}) \\ &= 4 \end{aligned}$$

(d) Division

$$\begin{aligned} \text{e.g. } & \frac{1}{4} \div \frac{5}{6} \\ &= \frac{1}{2} \times \frac{6}{5} \quad (\text{Interchange the numerator and denominator}) \\ &= \frac{3}{5} \end{aligned}$$

## 6. Arithmetic Operations of Decimals

(a) Addition

$$\begin{array}{r} \text{e.g. } 0.23 + 1.592 \\ = 1.822 \end{array} \quad \begin{array}{r} 0.23 \\ + 1.592 \\ \hline 1.822 \end{array}$$

(b) Subtraction

$$\begin{array}{r} \text{e.g. } 4.27 - 1.95 \\ = 2.32 \end{array} \quad \begin{array}{r} 4.27 \\ - 1.95 \\ \hline 2.32 \end{array}$$

(c) Multiplication

$$\begin{array}{r} \text{e.g. } 1.3 \times 2.4 \\ = 3.12 \end{array} \quad \begin{array}{r} 1.3 \\ \times 2.4 \\ \hline 3.12 \end{array}$$

(d) Division

$$\begin{array}{r} \text{e.g. } 12 \div 2.4 \\ = 5 \end{array} \quad \begin{array}{r} 5 \\ 24 \overline{)120} \\ \underline{120} \\ 0 \end{array}$$



### Translation Exercise

For questions 1 – 4, fill in the alphabet that represents the correct Chinese term.

- |        |       |        |         |
|--------|-------|--------|---------|
| A. 小數  | B. 分母 | C. 分數  | D. 假分數  |
| E. 帶分數 | F. 分子 | G. 真分數 | H. 最簡形式 |

1. Convert the following improper fractions to mixed fractions.

把下列 \_\_\_\_\_ 化為 \_\_\_\_\_ 。



## Extended Question

The area of a circle is  $\pi r^2$ , where  $r$  is the radius of the circle.

A wire of length 88 cm is bent to form a circle. Find,



(a) the radius of the circle; and (Hint: The length of the wire is the circumference of the circle.)

(b) the area of the circle.

(Take  $\pi = \frac{22}{7}$ )

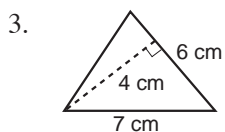


## Learning from Mistakes

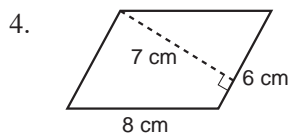
Correct the mistakes in the following questions.

1.  $1 \text{ m}^2$   
 $= 100 \text{ cm}^2$

2.  $1 \text{ km}^2$   
 $= 1000 \text{ m}^2$

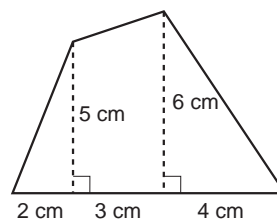


The area of the figure  
 $= \left(\frac{1}{2} \times 7 \times 4\right) \text{ cm}^2$   
 $= 14 \text{ cm}^2$



The area of the figure  
 $= (8 \times 6) \text{ cm}^2$   
 $= 48 \text{ cm}^2$

5. The area of the figure on the right  
 $= \frac{(2 + 3 + 4)(5 + 6)}{2} \text{ cm}^2$   
 $= 49.5 \text{ cm}^2$





## Open-ended Question

In the space below, draw

(a) two rectangles which have the same area of  $24 \text{ cm}^2$  but difference perimeters (周界) ;

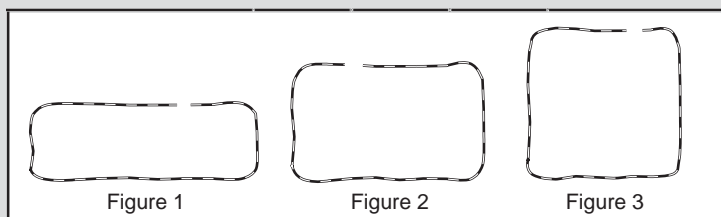
(b) two rectangles which have the same perimeter of 20 cm but difference areas.



## Enrichment Mathematics

### Figures with the same perimeter

You are given a string of 40 cm long to make a rectangle with the largest area. Do you know how special the rectangle is? Think before you continue to read.



In fact, among rectangles with the same perimeter, the largest rectangle will have four sides equal, i.e., it is a square (see Figure 3). In the above example, the largest area is  $100 \text{ cm}^2$ . You can examine it by drawing different rectangles. But if you want a proof, you will learn in higher form.

## Glossary

area

面積

base

底

height

高

length

長

parallelogram

平行四邊形

polygon

多邊形

rectangle

長方形

square

正方形

trapezium

梯形

triangle

三角形

width

闊

# Revision Test 2

Choose the most suitable answer from the four choices.

1. Which of the following is a multiple of 12?

- A. 25
- B. 34
- C. 48
- D. 66

2. Which of the following is not a prime number?

- A. 87
- B. 67
- C. 17
- D. 7

3. The L.C.M. of 18 and 30 is

- A. 6.
- B. 60.
- C. 90.
- D. 120.

4. Which of the following is not a factor of 288?

- A. 4
- B. 18
- C. 24
- D. 54

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

- A.  $3\frac{11}{24}$
- B.  $3\frac{3}{8}$
- C.  $3\frac{5}{8}$
- D.  $\frac{17}{24}$

6.  $\frac{0.25}{\frac{3}{4}} =$

- A.  $\frac{1}{3}$
- B.  $\frac{3}{16}$
- C.  $\frac{3}{16}$
- D. 3

7. Which of the following numbers are arranged in ascending order?

- A. 11, 5, 8
- B.  $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$
- C.  $\frac{3}{4}, \frac{3}{5}, \frac{3}{6}$
- D.  $\frac{2}{3}, \frac{3}{4}, \frac{4}{5}$

8. When a number is decreased by 10%, the result is 99. What is the number?

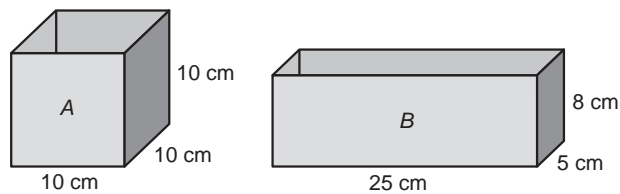
- A. 110
- B. 109
- C. 108.9
- D. 89.9

9.  $0.04\% =$

- A. 4
- B. 0.0004
- C.  $\frac{4}{100}$
- D. 4

# 9 Volumes

1. The following shows two different containers, one is in the shape of a cube and the other is in the shape of a cuboid.



The length of the sides of  $A$  is 10 cm and the dimensions of  $B$  are  $25\text{ cm} \times 5\text{ cm} \times 8\text{ cm}$ . Polly wants to put some cubic blocks with sides of 4 cm into the containers. Which one can hold more cubic blocks? Explain your answer briefly.

2. The following shows a metal cuboid with dimensions  $9\text{ cm} \times 4\text{ cm} \times 10\text{ cm}$ . It is melted and recast into a prism with right-angled triangles as the bases. Suggest two sets of dimensions,  $x\text{ cm} \times y\text{ cm} \times z\text{ cm}$ , of the prism.

