

# 6<sup>th</sup> Kyu

## 算数検定

### PROFICIENCY TEST IN PRACTICAL MATHEMATICS

Test Time : 50 minutes

#### Test Instructions

1. Make sure that you have the correct level (Kyu) test.
2. Do not open the booklet until you are told to do so.
3. Write your name, examinee number and other necessary information on the answer sheet.
4. Write your name and examinee number on this page.
5. You may use a ruler, protractor and compass. However, you may not use a calculator.
6. Turn off your cell phone and do not use it during the test.
7. Write your answers on the answer sheets provided.
8. If your answer contains a fraction, write the fraction in simplest form by reducing it to lowest terms.
9. Ask an examination supervisor if the printing on your problem sheets is unclear.

Please submit this test upon agreeing to the following "handling of personal information".

Information regarding the handling of all personal information attached to this form

1. Name of Organization : The Mathematics Certification Institute of Japan
2. Title, Affiliation and Contact Information of Personal Information Protection Administrator :  
Title : Personal Information Protection Administrator  
Department: Secretariat Contact Information : 03-5812-8340
3. Purpose for Use of Personal Information : Management of examinee information, marking, and for the purpose of identifying candidates
4. Provision of Personal Information to Third Parties : In cases where an application is made through the organization's office, registration information, names, test level and test results for the purpose of informing certification results via the Internet, fax, mail or electronic mail attachment, etc. will be provided to the applicant.
5. Outsourcing of Personal Information Handling : Personal information only for the purposes described in the preceding section, "purpose for using personal information", may be outsourced.
6. Requests for Disclosure of Personal Information : Examinees may submit inquiries to customer information concerning the disclosure of personal information concerning themselves. In this case, the Organization shall confirm the customer's identity and respond within a reasonable period. [Customer Information]  
The Mathematics Certification Institute of Japan, Certification Inquiry Desk  
Bunshodo Building 6F, 5-1-1 Ueno, Taito Ward, Tokyo, 110-0005  
Tel : 03-5660-4804 (Monday to Friday 9:30-17:00 not including national holidays, New Year's holidays and organization holidays)
7. Voluntariness of the Provision of Personal Information : Whether to provide personal information to the Organization is entirely up to the examinee. However, if the Organization does not receive accurate information, it may not be possible to provide certain services in an appropriate manner.

Name

Examinee  
Number



公益財団法人

日本数学検定協会

The Mathematics Certification Institute of Japan

**1**

Calculate.

*(Calculation skill)*

(1)  $1.6 \times 4.9$

(2)  $11.2 + 47.6 \div 2.8$

(3)  $\frac{1}{9} + \frac{2}{3}$

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

(5)  $\frac{5}{9} \times 18$

(6)  $3\frac{3}{7} \div 16$

(7)  $\frac{5}{6} \times \frac{9}{20}$

(8)  $\frac{3}{14} \div \frac{8}{21}$

**2**

Answer the following.

(9) Find the greatest common factor (GCF) of 24 and 42.

(10) Find the least common multiple (LCM) of 9, 12 and 18.

**3**

Write each of the following ratios in simplest form.

(11)  $25 : 40$ (12)  $7.2 : 8$ **4**

Fill in the blanks.

(13)  $3 : 4 = \square : 64$

(14)  $0.3 \text{ cm} = \square \text{ mm}$

(15)  $1840000 \text{ cm}^3 = \square \text{ m}^3$

5

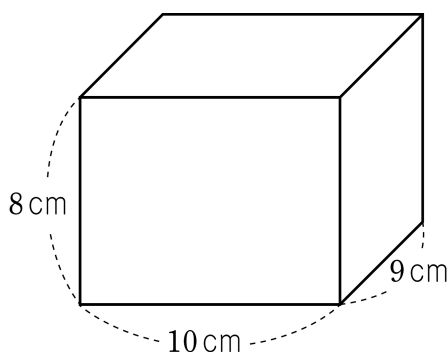
Kate bought pieces of linen fabric and cotton cloth at a handcraft shop. You don't need to consider tax.

- (16) A piece of linen fabric costs 1200 yen per meter. Find the cost, in yen, of a piece of 2.5 m linen fabric.
- (17) The shape of the linen fabric is a rectangle. The rectangle has a length of 2.5 m and a width of 0.9 m. Find the area, in  $\text{m}^2$ , of the piece of linen fabric.
- (18) A piece of 1.3 m cotton cloth costs 1170 yen. Find the cost, in yen, of the cotton cloth per meter.

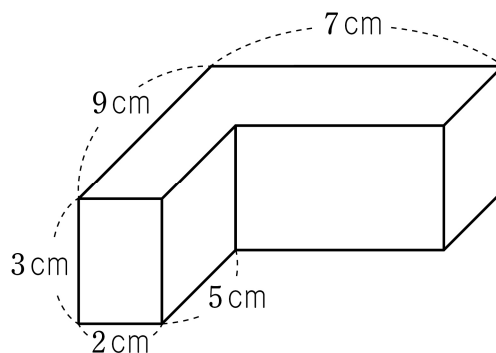
6

Find the volume, in  $\text{cm}^3$ , of each of the following solids. Include units in your answer. *(Measurement skill)*

(19) Rectangular prism



(20) Solid made up of rectangular prisms



7

Kevin asked all students in his class how much time they studied in a day and expressed the results as shown on the right. *(Statistical skill)*

- (21) Linda studied for 20 minutes. Which interval contains Linda?
- (22) The amount of time Kevin studied is the 15th longest time in the class. Which interval contains Kevin?
- (23) Find the total number of students in Kevin's class.

Study time in a day

Time (in minutes)		Number of students
more than or equal to	less than	
0	- 15	1
15	- 30	4
30	- 45	6
45	- 60	7
60	- 75	9
75	- 90	8
Total		

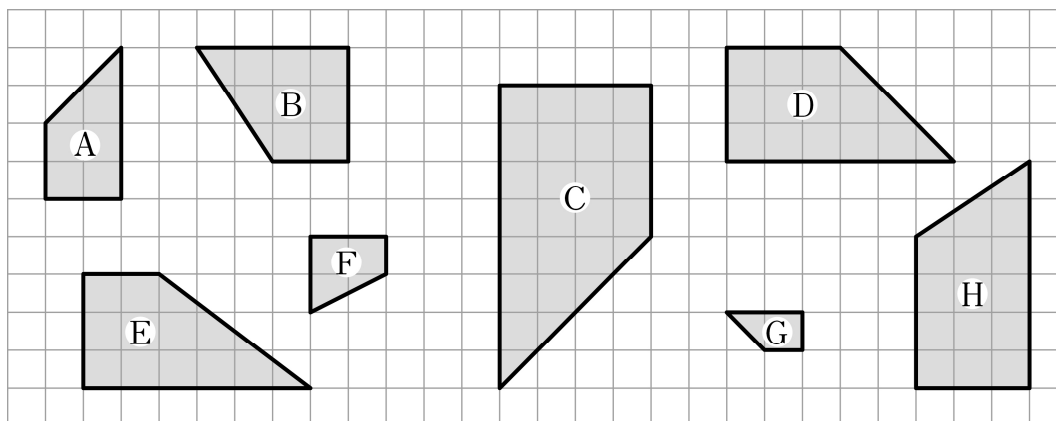
8

Patrick began to run at a speed of 140 m per minute in a race.

- (24) If he runs for 5 minutes at the same speed, how long, in m, would he run?
- (25) The distance he is running is 3000 m. He ran at a speed of 140 m per minute for the first 15 minutes. If he wants to arrive at the goal in exactly 20 minutes from the start, find the speed, in m per minute, he should run for the last 5 minutes.

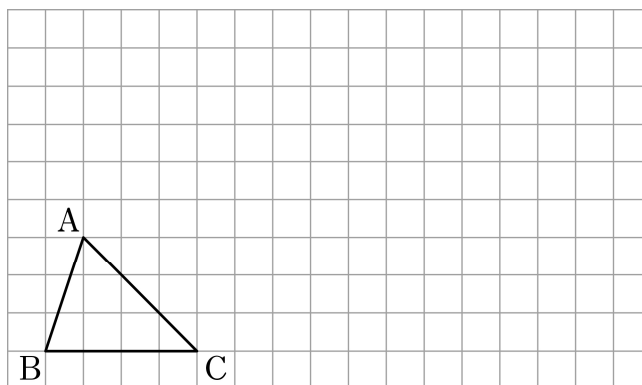
9

Look at the following eight figures from A to H.



- (26) Which figure is the enlargement of A with a scale factor of 2? Choose one from B to H and write the corresponding letter.
- (27) Figure G is the image of Figure D under a reduction with a certain scale factor. Find the scale factor as a fraction whose numerator is 1.
- (28) The figure on the right shows triangle ABC. Draw a figure that is triangle ABC enlarged with a scale factor of 2 on the answer sheet.

(Construction skill)



- 10** Look at the following formulae that are formed according to a certain rule.  
(Organizing skill)

1st formula	$1 = 1 \times 1$
2nd formula	$1 + 3 = 2 \times 2$
3rd formula	$1 + 3 + 5 = 3 \times 3$
4th formula	$1 + 3 + 5 + 7 = 4 \times 4$
...	...

- (29) Consider the 7th formula. Similar to the expressions above, find the addition for A and find the multiplication for B below.

$$\text{7th formula} \quad ( \quad A \quad ) = ( \quad B \quad )$$

- (30) Find the number for C below.

121 appears as the result of the calculation in the ( C )th formula.