

3rd Kyu

Section 1: Calculation Test

数学検定

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 and examinee number on this page.
4. Write your name, examinee number and other necessary information on the answer sheet.
5. Write only answers on the answer sheets provided.
6. If your answer contains a fraction, write the fraction in simplest form by reducing it to lowest terms.
7. If your answer contains a radical, write your answer in simplest radical form. For example, $\sqrt{12}$ must be expressed as $2\sqrt{3}$.
8. You may not use a calculator, ruler or compass.
9. Turn off your cell phone and do not use it during the test.
10. Ask an examination supervisor if your problem sheets have inconsistent page numbering or missing pages.
11. It is prohibited to disclose the problems to the general public, such as on the Internet, without permission.

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

[3rd Kyu] Section 1: Calculation Test**1**

Simplify.

(1) $17 - (-4) - 9$

(2) $-20 - 8 \div 4$

(3) $(-4)^2 + 3 \times (-2^2)$

(4) $(-0.3)^2 + 1.1^2$

(5) $\sqrt{20} + \sqrt{45} - 4\sqrt{5}$

(6) $(\sqrt{7} + 3)(\sqrt{7} - 1) - \frac{14}{\sqrt{7}}$

(7) $2(x - 4) + 5(x + 1)$

(8) $1.2(5x - 2) - 0.3(x - 5)$

(9) $9(4x - y) + 7(2x - 3y)$

(10) $\frac{4x + y}{2} - \frac{2x + 7y}{3}$

(11) $63x^2y^3 \div 7xy^2$

(12) $\frac{15}{16}xy \div \left(\frac{3}{4}xy\right)^2 \times \frac{3}{8}xy^2$

2

Expand and simplify the following expressions.

(13) $(x + 2y)(3x - 5y)$

(14) $(x - 4)^2 - (x + 8)(x + 2)$

3

Factorize the following expressions.

(15) $x^2 - 64y^2$

(16) $(3x - y)^2 + 7(3x - y) + 10$

4Solve for x in the following equations.

(17) $9x - 1 = 4x + 14$

(18) $\frac{2x - 3}{5} = 3x + 15$

(19) $16x^2 = 3$

(20) $x^2 + 6x - 11 = 0$

5

Solve the following systems of equations.

(21)
$$\begin{cases} 2x - y = 11 \\ 3x + 2y = 6 \end{cases}$$

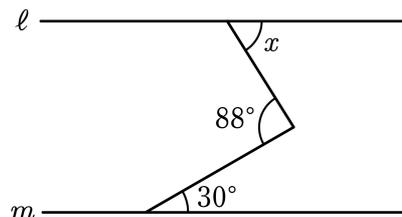
(22)
$$\begin{cases} 0.2x + 1.3y = 0.3 \\ \frac{1}{4}x + \frac{1}{3}y = 1\frac{2}{3} \end{cases}$$

6

Answer the following.

- (23) Find the value of $4x + 20$ when $x = -6$.
- (24) Two dice, A and B, are both numbered 1 to 6. When they are rolled, find the probability that the sum of the numbers facing up is 4.
- (25) Make c the subject of $a = 2b + \frac{1}{3}c$.
- (26) y is directly proportional to x and $y = -35$ when $x = 5$. Express y in terms of x .
- (27) y is directly proportional to the square of x and $y = 10$ when $x = -1$. Find the value of y when $x = 2$.
- (28) Find the measure of each interior angle of a regular octagon. An octagon is an 8-sided polygon.

- (29) In the figure on the right, find $\angle x$ when $\ell \parallel m$.



- (30) In the figure on the right, four points A, B, C and D lie on the circumference of circle O. Find $\angle x$ when AC is the diameter of the circle and $\angle ABD = 50^\circ$.

