2012 年度日本政府(文部科学省)奨学金留学生選考試験

QUALIFYING EXAMINATION FOR APPLICANTS FOR JAPANESE

GOVERNMENT (MONBUKAGAKUSHO) SCHOLARSHIPS 2012

学科試験 問題

EXAMINATION QUESTIONS

(専修学校留学生)

SPECIALIZED TRAINING COLLEGE STUDENTS

数 学

MATHEMATICS

注意 ☆試験時間は60分。

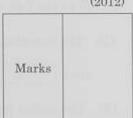
PLEASE NOTE: THE TEST PERIOD IS 60 MINUTES.

(2012)

MATHEMATICS

Nationality No.

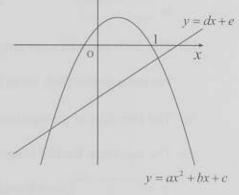
(Please print full name, underlining family name)



Note that all the answers should be written on the answer sheet.

- Fill in the following blanks with the correct answers.
- (1) $(2x+1)^2 4(x^2-3) =$
- (2) $(-2x^2y)^3 + (xy^2z)^2 \times (-yz)^2 =$
- (3) One solution of the quadratic equation $x^2 + px + 12 = 0$ is 3, then $p = \boxed{ }$ and another solution is $\boxed{ }$
- (4) When x + y = 3 and xy = 1, then $x^2 + y^2 = \boxed{ }$ and $x^5 + y^5 = \boxed{ }$
- (6) There are six points on a circumference. Make as many triangles as possible using three points among them, then the number of the triangles that can be made is ______.
- (7) The 20th term in a progression: 1, 4, 7, 10, ... is ① , and the sum from the 1st term to the 20th term is ② ...
- (8) The inradius of an equilateral triangle whose one side length is 2, is ______.
- (9) The equation for the tangent line at point (1,0) in the curve $y = 3x^2 4x + 1$ is, $y = \bigcirc$, and the area surrounded by the curve, the tangent line and the y-axis is \bigcirc .

- 2. On the plane xy, there are three points: A(3,4), B(2,2), C(6,0). Fill in the following blanks with the correct answers.
- (1) The coordinates of the center of a circle on which points, A, B, and C are located, 2), and the radius of this circle is 3
- The scalar product of two vectors $BA \cdot BC =$ (2)
- $\angle ABC =$ (3)
- The distance from point B to the straight line AC is (4)
- When point L is the intersection of bisector of $\angle ABC$ and side AC, then AL:LC=1:
- ① BA + BC. BL =(6)
- On the plane xy, graphs of parabola $y = ax^2 + bx + c$ and straight line y = dx + eare shown in the figure below. Judge whether the following expressions are larger than, smaller than or equal to zero. Fill in the blanks with the correct marks; > ,
- (1) a
- (2) b
- 0 (3) d
- (4) $b^2 4ac$ 0
- (5) a+b+c 0 (6) a-b+c
- 0 (8) c-e (7) 4a+2b+c



y