2015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 2015

学科試験 問題

EXAMINATION QUESTIONS

(専修学校留学生)

SPECIAL TRAINING COLLEGE STUDENTS

数 学

MATHEMATICS

注意☆試験時間は60分。

PLEASE NOTE : THE TEST PERIOD IS 60 MINUTES.

MA	THEN	MATICS	

Nationality	No.
Name	(Please print full name, underlining family name)
Name	

Marks	-

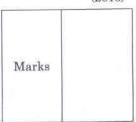
answer sheet

que	stion			answer		
	(1)	1		2		
	(2)					
	(3)					
	(4)	①		2		1 a
	(5)					
	(6)					
	(7)	①		2		
	(8)	①		2		
	(9)	①		2		
	(10)	①	2		3	
	(1)	1	2		3	
2	(2)	1		2		
	(3)	1		2		
		3		4		
3	(1)			1		
	(2)	①	2		3	
	(3)					

(2015)

MATHEMATICS

Nationality		No.	
Name	(Please prifamily nam	ne, und	erlining



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

- 1. Fill in the following blanks with the correct numbers.
- (1) When a > 0, then what is the range of x that satisfies the following inequality:

$$ax^2 - 3ax + 2a < 0$$

- (2) If $4^{3x-1} 2^{5x-4} = 0$, then x =
- (3) $10^{\log_{10} 5} =$
- (4) When α and β are the solutions of the quadratic equation $x^2 5x + 3 = 0$, then $\alpha^2 + \beta^2 = \bigcirc$ ① , $(\alpha \beta)^2 = \bigcirc$ ② .
- (5) When $|\vec{a}|=1$, $|\vec{b}|=2$, $|\vec{a}-\vec{b}|=\sqrt{7}$, then the degree measure of the angle between \vec{a} and \vec{b} is $\boxed{}$ °.
- (6) When $\triangle ABC$ is a triangle where $\angle A=30^{\circ}$, then $\sin(\angle B+\angle C)$ is ______.
- (7) How many multiples of 3 are there among integers from 100 to 200?

 The answer is ① , and the sum of those multiples of 3 is ② .
- (8) When $x^3 + ax^2 + bx + 5$ is divisible by x 1 and has a remainder of 5 when divided by x 2, then $a = \boxed{\textcircled{1}}$, $b = \boxed{\textcircled{2}}$.
- (9) Let $f(x) = |x^2 1|$. Then $f(0) = \boxed{ }$, $\int_0^2 f(x) dx = \boxed{ }$
- (10) Assume that a,b and c are consecutive terms of arithmetic progression (a < b < c). If a + b + c = 24 and abc = 440, then $a = \boxed{\bigcirc}$, $b = \boxed{\bigcirc}$, $c = \boxed{\bigcirc}$.

- 2. On the plane xy, there are four points; O (0,0), A (0,3), B (0,-3), C (4,0). Fill in the following blanks with the correct numbers.
 - (1) The equation of the straight line AC is x + y 3 = 0
- (3) When point D is the intersection of bisector of $\angle ABC$ and x-axis, then $OD:DC=\boxed{\textcircled{1}}:\boxed{\textcircled{2}}$ and the coordinates of the inner center of $\triangle ABC$ are $\boxed{\textcircled{3}}$, $\boxed{\textcircled{4}}$.
- 3. The line (a); y=x+k (k is a constant) is tangent to both the parabola (b); $y=x^2-5x+7$ and the parabola (c); $y=x^2+3x-1$.

Point P is the point of tangency of the line (a) and the parabola (b), point Q is the point of tangency of the line (a) and the parabola (c) and point R is the intersection of the parabola (b) and the parabola (c).

Fill in the following blanks with the correct numbers.

- (1) The constant $k = \boxed{}$.
- (2) The x-coordinate of the point P is \bigcirc , the x-coordinate of the point Q is \bigcirc and the x-coordinate of the point R is \bigcirc .
- (3) The area surrounded by the line (a), the parabola (b) and the parabola (c) is

