

# 가톨릭대학교 2017학년도 편입학 영어·수학 A형

(일반·학사) 편입학 지원전공(학과) : \_\_\_\_\_

성명 : \_\_\_\_\_ 수험번호 : \_\_\_\_\_

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1. 수험생 인적사항과 답안은 반드시 검정색 필기구로 작성하시기 바랍니다.  
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4. 문제유형을 정확하게 선택하십시오.



**가톨릭대학교**  
THE CATHOLIC UNIVERSITY OF KOREA

2017학년도 가톨릭대학교 편입학 시험 문제지

영 어 · 수 학 (A형)

[1-3] 빈칸에 들어갈 가장 적절한 표현을 고르시오.

1. Some researchers argue that pain can be \_\_\_\_\_. The pain sensations of others can be felt by some people, just by witnessing their agony.

- ① chronic                      ② contagious
- ③ empowering                ④ manipulated

2. Loneliness is an especially tricky problem because accepting and declaring our loneliness carries profound \_\_\_\_\_. If we admit we are lonely, others might think that we have failed in life's most fundamental domains: belonging, love, and attachment.

- ① benefits                      ② obligations
- ③ prestige                       ④ stigma

3. The growing popularity of artificial intelligence technology will likely lead to millions of lost jobs, especially among less-educated workers, and could \_\_\_\_\_ the economic divide between socioeconomic classes in our society.

- ① alleviate                      ② conceal
- ③ exacerbate                    ④ mandate

[4-5] 빈칸에 들어갈 가장 적절한 표현을 고르시오.

4. Many germs have had to devise tricks to let them spread between potential victims, and many of those tricks are \_\_\_\_\_ we experience as "symptoms of disease."

- ① what                          ② that
- ③ while                         ④ which

5. If you are lucky, you may get a chance to see the sun \_\_\_\_\_ an omega shape, \_\_\_\_\_ the most beautiful shape for the setting sun.

- ① make - to consider        ② make - considered
- ③ making - considering     ④ making - to consider

[6-10] 빈칸에 들어갈 가장 적절한 표현을 고르시오.

6. While the frontier idealized the rugged and tough individuals as the great American hero, the need for self-reliance on the frontier encouraged \_\_\_\_\_. Frontier men and women not only had to provide most of their daily life essentials, but they were also constantly

facing new problems and situations that demanded creative solutions. Observers from other countries were very impressed by the frontiersman's ability to make up new useful farm tools. They were equally impressed by the pioneer woman's ability to make unique clothing, candles, soap, and many other items needed for their daily life of her family.

- ① an adventurous lifestyle
- ② a spirit of inventiveness
- ③ the concept of gender equality
- ④ a strong sense of individualism

7. The Japanese are fanatics for fresh food. As a result, Japanese food-processing companies enjoy local monopolies. A milk producer in northern Japan cannot hope to compete in southern Japan, because transporting milk there would take an extra day or two, a fatal disadvantage in the eyes of consumers. These local monopolies are reinforced by the Japanese government, which obstructs the import of foreign processed food by imposing a 10-day quarantine, among other restrictions. Hence Japanese food-producing companies \_\_\_\_\_.

- ① are compelled to rely heavily on imported food
- ② strategically optimize their operations on a global level
- ③ are preoccupied with ways to prolong the shelf life of food
- ④ are not exposed to either domestic or foreign competition

8. In love with whole numbers, the Pythagoreans believed that all things could be derived from them, certainly all other numbers. \_\_\_\_\_ when they discovered that the square root of two (the ratio of the diagonal to the side of a square) was irrational, that  $\sqrt{2}$  cannot be expressed accurately as the ratio of any two whole numbers. Ironically this discovery was made with the Pythagorean theorem as a tool. "Irrational" originally meant only that a number could not be expressed as a ratio. But for the Pythagoreans it came to mean something threatening, a hint that their world view might not make sense, which is today the other meaning of "irrational."

- ① The public were dubious
- ② A crisis in doctrine arose
- ③ They became even more convinced
- ④ The uncertainties finally cleared up

9. In the spring of 1918, a deadly flu virus attacked the world. The virus infected as much as 40 percent of the global population. The pandemic became commonly known as the “Spanish Flu” or the “Spanish Lady” in the United States and Europe. Many assumed this was because the sickness had originated from the Iberian Peninsula, but the nickname was actually the result of a widespread misunderstanding. Spain was one of only a few major European countries to remain neutral during World War I. Unlike in the Allied and Central Powers nations, where wartime censors suppressed news of the flu to avoid affecting morale, the Spanish media was free to report on it in gory detail. Since nations undergoing a media blackout could only read in depth accounts from Spanish news sources, they naturally assumed that \_\_\_\_\_.

- ① the country was the pandemic’s ground zero
- ② Spain would stay neutral until the end of the war
- ③ Spain’s media enjoyed more freedom than any other country
- ④ the country was falsely branded as the major disseminator of the flu

10. Consider the tragic tampering case in which eight people died from swallowing cyanide-laced capsules of Tylenol. Although Johnson & Johnson believed that the pills had been altered in only a few stores, not in the factory, it quickly recalled all of its product. The recall cost the company \$240 million in earnings. In the long run, however, the company’s swift recall of Tylenol strengthened consumer confidence and loyalty, and Tylenol remains as the nation’s leading brand of pain reliever. Johnson & Johnson management found that \_\_\_\_\_.

- ① the costs of attracting new customers are fast rising
- ② satisfying customer needs is the top priority in marketing
- ③ it is crucial to create profitable relationships with customers
- ④ doing what’s right benefits both customers and the company

[11-13] 다음 글을 읽고 물음에 답하시오.

11. An examination of our class structure reveals that gambling is more the concern of the lower and upper social classes than of the middle classes, and there is a very good reason for this if we accept it as an expression of a basic hunting drive. Work has become the major substitute for primitive hunting, but as such it has most benefited the middle classes. For the average lower-class male, the nature of the work he is required to do is poorly suited to the demands of the hunting drive. It is too repetitive, too predictable. It lacks the elements of challenge, luck and risk so essential to the hunting male. For this reason, lower-class males share with the (non-working) upper-class males a greater need to express their hunting urges than do the middle classes, the nature of whose work is much more suited to its role as a hunting substitute.

Q: What is the passage mainly about?

- ① evolutionary view of social structure in human history
- ② common and distinct features of hunting and gambling
- ③ relationship between social stratification and the division of labor
- ④ reasons for levels of predisposition to gambling across social classes

12. The accuracy and speed of real-time automatic translation is undoubtedly going to improve dramatically in the near future, but it is going to take much longer before this medium becomes globally widespread and economically accessible to all. This poses a threat to the current availability and appeal of a global language. All the evidence suggests that the position of English as a global language is going to become stronger. By the time automatic translation matures as a popular communicative medium, that position will very likely have become impregnable. It will be very interesting to see what happens then – whether the presence of a global language will eliminate the demand for world translation services, or whether the economics of automatic translation will so undercut the cost of global language learning that the latter will become obsolete.

Q: What is the best title for the passage?

- ① What Are the Dangers of a Global Language?
- ② Why Computers Will Never Be a Smart Translator
- ③ The Battle Between Technology and Global Language
- ④ Automatic Translation and the End of Language Learning

13. If we lived on a planet where nothing ever changed, there would be little to do. There would be nothing to figure out. (A) And if we lived in an unpredictable world, where things changed in random or very complex ways, we would not be able to figure things out. (B) Again, there would be no such thing as science. (C) But we live in an in-between universe, where things change, but according to patterns, rules, or, as we call them, laws of nature. (D) There would be no impetus for science. If I throw a stick up in the air, it always falls down. If the sun sets in the west, it always rises again the next morning in the east. And so it becomes possible to figure things out. We can do science, and with it we can improve our lives.

Q: Which of the following is the best order?

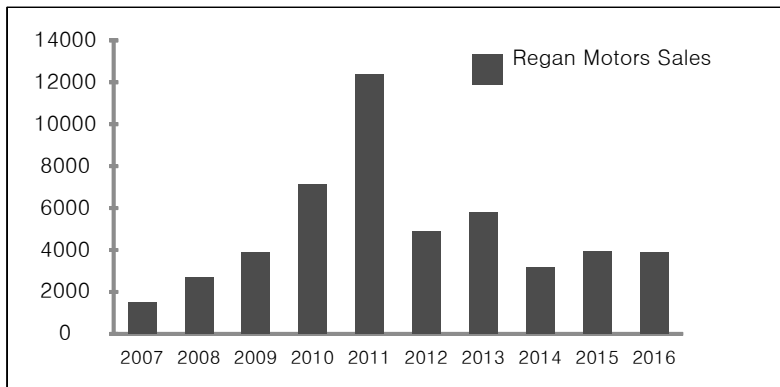
- ① (A) - (C) - (D) - (B)
- ② (A) - (D) - (C) - (B)
- ③ (D) - (A) - (B) - (C)
- ④ (D) - (C) - (A) - (B)

[14-15] 다음 글을 읽고 물음에 답하시오.

Dear Janis,

I'm relaying a memo from our procurement department regarding the additional purchase from Regan Motors. The procurement people strongly advise against purchasing Regan automobiles. While Regan Motors used to hold the No. 1 spot in the auto market, its sales performance has been unstable in recent years, and has been in the decline. The great surge in sales in 2011 propelled by Regan's competitive price was hit hard the very next year due to a massive defect recall. The second downturn shown in the attached graph was largely the result of Regan's inability to introduce new energy efficient vehicles to the market. In addition, Regan has discontinued most of the trucks and vans our company purchases, and as a result, we are not able to receive adequate customer service. Therefore, it is the procurement department's opinion that we seek other options for next year. Let me know what you think.

James Cann  
Manager, Finance Department



14. What is the reason behind the sales drop in 2014?

- ① unsatisfactory customer service
- ② a defect recall by the manufacturer
- ③ Regan Motors' failure to develop new products
- ④ Regan Motors' decision to discontinue its models

15. What does the writer of the email suggest?

- ① to maintain customer loyalty
- ② to renew the contract with Regan Motors
- ③ to place an order from a different company
- ④ to conduct research on product management

[16-17] 다음 글을 읽고 물음에 답하시오.

Carnivores have fleas but primates do not. Monkeys and apes are plagued by lice and certain other external parasites, but, contrary to popular belief, they are completely flealess for one very good reason. To understand this, it is necessary to examine the life-cycle of the flea. This insect lays its eggs, not on the body of its host, but amongst the detritus of its victim's sleeping quarters. The eggs take three days to hatch into small, crawling maggots. These larvae do not feed on blood, but on the waste matter that has accumulated in the dirt of the den or lair. After two weeks they spin a cocoon and pupate. They remain in this dormant condition for approximately two more weeks before emerging as adults, ready to hop on to a suitable host body. So, for at least the first month of its life a flea is cut off from its host species. It is clear from this why a \_\_\_\_\_ mammal, such as a monkey or ape, is not troubled by fleas. Even if a few stray fleas happen to be on one and mate successfully, their eggs will be left behind as the primate group moves on, and when the pupae hatch there will be no host "at home" to continue the relationship.

16. Choose the best word for the blank.

- ① tropical
- ② subterranean
- ③ primitive
- ④ nomadic

17. According to the passage, which of the following is true about a flea?

- ① Its larva feeds on blood and flesh of its host.
- ② It is parasitic on the body of its host from its birth.
- ③ It lives as a pupa about as long as it does as a larva.
- ④ It takes about 17 days for its egg to become an adult.

[18-20] 다음 글을 읽고 물음에 답하시오.

When we digest a slice of bread, we break the carbohydrates into simple sugars and its proteins into amino acids. At the same time, we also break down and rebuild the proteins of our own skin, muscles, and bones. All organisms continually break down macromolecules and reuse the building blocks.

Organisms have to assemble and disassemble macromolecules easily. The bonds that hold macromolecules together must be strong enough so that the macromolecules will not fall apart. But the bonds must not be so strong that organisms can't easily take them apart when they need to. Like children's pop beads and Legos bricks, the building blocks of life easily snap together and easily snap apart.

Amazingly, biological building blocks all snap together in the same way. The building blocks of all the major macromolecules join by the same simple chemical reaction. In every case, enzymes (molecules that help make and break chemical bonds) remove two hydrogen atoms and one oxygen atom from between pairs of building blocks,

forming a bond. Removing two hydrogens and an oxygen—the equivalent of one molecule of water—is called a dehydration condensation reaction, because one water molecule is removed.

To snap apart macromolecules, organisms reverse the dehydration condensation reaction, adding one water molecule to each pair of building blocks. Enzymes detach each small molecule from a macromolecule by adding one molecule of water, a process called hydrolysis [Greek, *hydro* = water + *lysis* = breaking].

Although all the building blocks are joined by similar dehydration condensation reactions, the exact bonds that form are different in each case. For example, sugars form *glycosidic bonds*, while amino acids form *peptide bonds*.

18. What is the topic of the passage?

- ① the way organisms store and consume energy
- ② the types of chemical bonds formed by enzymes
- ③ the intricate structure of bonds holding macromolecules together
- ④ the role of enzymes in the mechanism of the building blocks of life

19. Based on the passage, choose the best words for the blanks in the following statement.

Enzymes link two building blocks by \_\_\_\_\_ the equivalent of one water molecule. Enzymes add a water molecule to \_\_\_\_\_ a long chain into two single building blocks.

- ① taking away - break
- ② taking away - form
- ③ adding - break
- ④ adding - form

20. Which of the following is NOT true according to the passage?

- ① All living things including humans constantly break down macromolecules.
- ② Macromolecular bonding is so strong that building blocks do not snap apart.
- ③ How biological building blocks are linked is identical for all the major molecules.
- ④ The bonds that form from dehydration are different in each case.

21. 다음 극한값은?

$$\lim_{x \rightarrow 0} \frac{x \sin x}{1 - \cos x}$$

- ① 0
- ②  $\frac{1}{2}$
- ③ 1
- ④ 2

22. 함수  $y = \frac{3x}{x^2 + 4}$  의 최댓값은?

- ①  $\frac{3}{2}$
- ②  $\frac{\sqrt{3}}{2}$
- ③  $\frac{3}{4}$
- ④  $\frac{2}{3}$

23. 양수  $a$ 에 대하여 집합  $A$ 와  $B$ 는 다음과 같다.

$$A = \{x : |x - 1| < 0.1\}, B = \{x : |x^3 - 1| < a\}$$

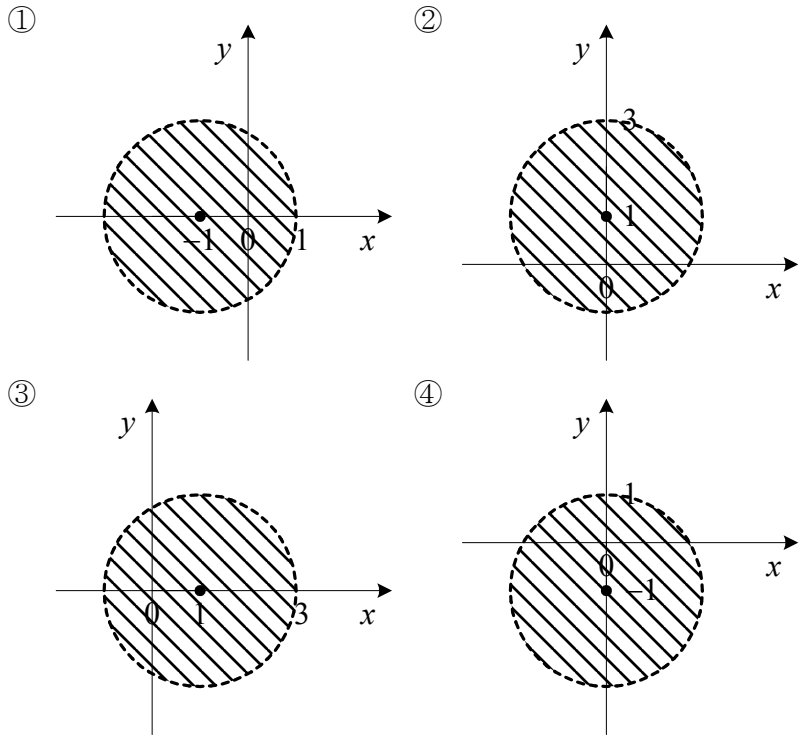
명제  $p$ 와  $q$ 의 진리집합을 각각  $A$ 와  $B$ 라고 할 때,  $q$ 가  $p$ 이기 위한 필요조건이 되는  $a$ 의 최솟값은?

- ① 0.001
- ② 0.1
- ③ 0.271
- ④ 0.331

24. 직선  $y = ax + 3$ 이 곡선  $y = 2\sqrt{x} + 1$ 에 접할 때,  $a$ 의 값은?

- ①  $\frac{1}{4}$
- ②  $\frac{1}{3}$
- ③  $\frac{1}{2}$
- ④ 1

25. 어떤 실수  $a$ 에 대해서도 직선  $2ax + (a^2 - 1)y + 3a^2 + 1 = 0$ 이 지나지 않는 점들로 이루어진 영역은?



26. 다음 정적분의 값은?

$$\int_0^{\frac{\pi}{2}} \frac{\sin 2x}{2(1 + \cos x)} dx$$

- ①  $1 - \ln 3$     ②  $1 - \ln 2$     ③  $1 + \ln 2$     ④  $1 + \ln 3$

27. 함수  $f(x) = 2e^x + e^{2x} - 10$ 에 대하여  $f(x) = 0$ 의 해를 근사적으로 구하기 위해 뉴턴의 방법을 적용하려고 한다. 첫 번째 근사값이 0일 때, 두 번째 근사값은 얼마인가?

- ①  $-\frac{7}{4}$     ②  $-\frac{4}{7}$     ③  $\frac{4}{7}$     ④  $\frac{7}{4}$

28. 다음 중 두 평면  $5x - y - 2z = 2$ 와  $4x + y - z = 4$ 의 교선의 방정식은?

- ①  $x = -y + 2 = \frac{z + 2}{3}$     ②  $\frac{x}{3} = y - 2 = -z - 2$   
 ③  $x - 2 = \frac{y}{3} = z - 4$     ④  $x - \frac{2}{3} = y - \frac{4}{3} = -\frac{z}{3}$

29. 어떤 입자의 위치벡터가  $\mathbf{r}(t) = \langle t^2, 3t, t^2 - 8t \rangle$ 일 때, 속력이 최소가 되는  $t$ 의 값은?

- ① 1    ② 2    ③ 3    ④ 4

30. 점  $(1, 2)$ 에서 함수  $f(x, y) = x^2 + y^2 - x - 3y$ 의 최대변화율은?

- ①  $\sqrt{2}$     ② 2    ③  $\sqrt{5}$     ④ 5

31. 포물선  $x = y^2 + y - 1$  위의 두 점  $P$ 와  $Q$ 가  $P \neq Q$ 이고 직선  $x + y = 0$ 에 대하여 서로 대칭이다. 선분  $\overline{PQ}$ 의 길이는?

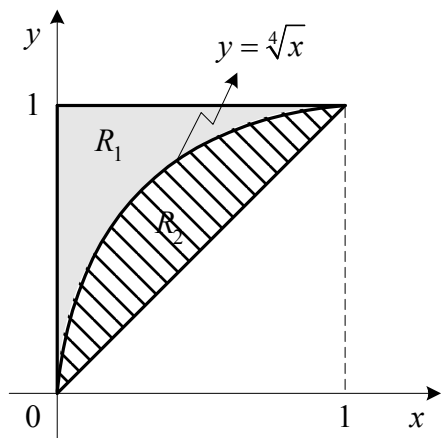
- ①  $\sqrt{2}$     ② 2    ③  $2\sqrt{2}$     ④ 4

32. 함수  $f(x)$ 가 다음 조건을 만족시킬 때,  $f\left(\frac{1}{2}\right)$ 은 얼마인가? (단,  $f(x) > 0$ 이다.)

$$\int_0^x e^t \{f(t) + f'(t)\} dt = f(x)f\left(-\frac{x}{2}\right) - 1$$

- ①  $\frac{1}{e}$       ②  $e$       ③  $0$       ④  $1$

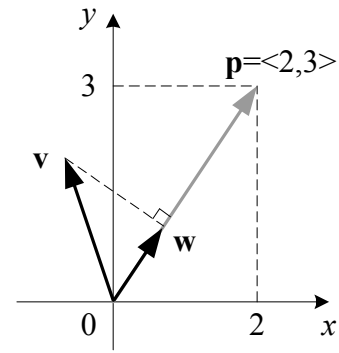
33. 아래 그림과 같이  $x=0$ ,  $y=1$ ,  $y=\sqrt[4]{x}$ 로 둘러싸인 영역  $R_1$ 과  $y=x$ ,  $y=\sqrt[4]{x}$ 로 둘러싸인 영역  $R_2$ 에 대하여  $V_1$ 과  $V_2$ 가 다음과 같을 때,  $V_1:V_2$ 는?



$V_1$ : 영역  $R_1$ 을  $x$ 축을 중심으로 회전시킬 때 생기는 입체의 부피  
 $V_2$ : 영역  $R_2$ 를  $y$ 축을 중심으로 회전시킬 때 생기는 입체의 부피

- ① 1:1      ② 2:3      ③ 2:1      ④ 3:2

34. 아래 그림과 같이 벡터  $\mathbf{v}$ 를 벡터  $\mathbf{p} = \langle 2, 3 \rangle$ 에 대한 정사영  $\mathbf{w}$ 로 대응시키는 변환을 나타내는 행렬은?



- ①  $\frac{1}{5} \begin{pmatrix} -46 \\ -69 \end{pmatrix}$       ②  $\frac{1}{5} \begin{pmatrix} -23 \\ -46 \end{pmatrix}$       ③  $\frac{1}{13} \begin{pmatrix} 23 \\ 69 \end{pmatrix}$       ④  $\frac{1}{13} \begin{pmatrix} 46 \\ 69 \end{pmatrix}$

35. 행렬  $A$ 의 특성다항식이  $p(\lambda) = \lambda^3 - 6\lambda^2 + 9\lambda - 2$ 일 때,  $A$ 의 행렬식은 얼마인가?

- ①  $-6$       ②  $-2$       ③  $2$       ④  $6$

36. 수열  $\{a_n\}$ 과  $\{b_n\}$ 은 다음을 만족한다.

$$a_0 = 1, \quad a_1 = 1, \quad a_{n+2} = 2a_{n+1} + a_n \quad (n = 0, 1, 2, \dots)$$

$$b_n = \frac{a_{n+1}}{a_n} \quad (n = 0, 1, 2, \dots)$$

수열  $\{b_n\}$ 의 극한값이 존재할 때, 급수  $f(x) = \sum_{n=0}^{\infty} a_n x^n$ 의 수렴 반지름은?

- ①  $\sqrt{2}-1$       ②  $\frac{1}{2}$       ③  $1$       ④  $\sqrt{2}+1$

37. 다음 조건을 만족하는  $x, y, z$ 에 대하여  $x+2y+3z$ 의 최댓값은?

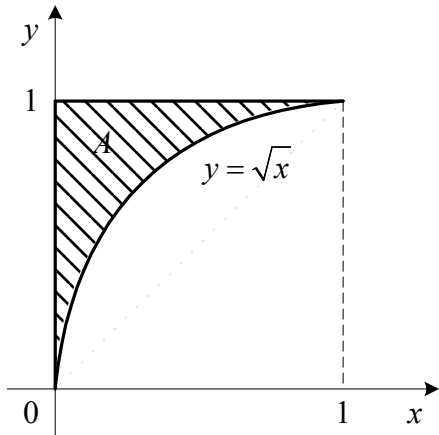
$$x^2 + y^2 + z^2 + 6y = 5$$

- ① 6                      ② 8                      ③ 10                      ④ 12

38. 영역  $A$ 가 아래 그림과 같을 때, 확률변수  $X$ 와  $Y$ 의 결합 밀도함수가

$$f(x, y) = \begin{cases} c\sqrt{1+3y^3}, & y \in A \\ 0, & y \notin A \end{cases}$$

이다. 상수  $c$ 의 값은?



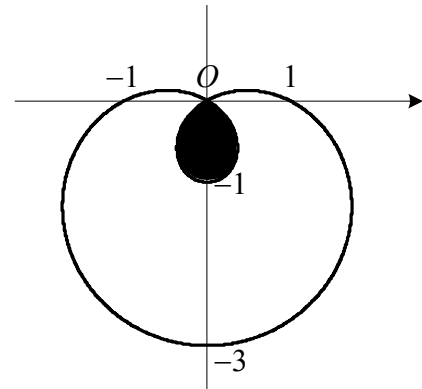
- ①  $\frac{14}{81}$                       ②  $\frac{14}{27}$                       ③  $\frac{27}{14}$                       ④  $\frac{81}{14}$

39. 다음 등식을 만족하는 실수  $x$  중 가장 큰 것은?

$$1 + \frac{x}{3!} + \frac{x^2}{5!} + \frac{x^3}{7!} + \dots = 0$$

- ①  $-2\pi^2$                       ②  $-\pi^2$                       ③  $-\frac{\pi^2}{2}$                       ④  $-\frac{\pi^2}{4}$

40. 아래 그림은 극곡선  $r=1-2\sin\theta$ 를 그린 것이다. 빗금 친 부분의 넓이는?



- ①  $\frac{\pi}{2} - \frac{3\sqrt{3}}{4}$                       ②  $\pi - \frac{3\sqrt{3}}{2}$                       ③  $\pi - \sqrt{3}$                       ④  $2\pi - \sqrt{3}$