

2012학년도 송실대학교 편입학 시험 문제



[본 기출문제에 관한 저작권은 송실대학교에 있습니다.]

영어 및 수학(A형)

지망학과(부) :

수험번호 :

성명 :

[1] Choose the one that is grammatically or lexically NOT correct. (1.5점)

[1] Once a solid international brand, a maker of cameras and medical equipment, Olympus Corp. is now at the center of a global investigation ① as to whether, and ② to what extent, its top management was ③ involving in funneling ④ billions of dollars in allegedly illicit payments to offshore accounts.

[2-3] Choose the most appropriate expression for each blank. (문항 당 1.5점)

[2] Salt is another example of a demonized compound. While our hearts can't beat without it, too much _____ can increase blood pressure to dangerous levels--but only in 10% of the population, with African Americans being particularly sensitive.

- ① cholesterol ② exercise ③ fat ④ sodium

[3] The Organization for Economic Co-operation and Development says the U.K. has the worst social _____ of the developed nations: those born to a certain class tend to stay there.

- ① class ② mobility ③ security ④ welfare

[4-5] Choose the expression that has the closest meaning to the underlined part. (문항 당 1점)

[4] By the time Ibn Battuta returned to Tangier, he had traversed--by foot, by donkey, by camel and by boat--nearly the entire length of the Muslim world and beyond on a quest for knowledge and experience.

- ① crossed ② conquered ③ surveyed ④ witnessed

[5] If history is a guide, the worse Obama fares as commander in chief, the better he might shine as ex-commander in chief. "It may sound whimsical, but it's true," says historian Richard Norton Smith. An administration that ends badly creates an equal and opposite zeal for rehabilitating a legacy, says Smith.

- ① direction ② passion ③ requirement ④ tendency

[6-7] Read the following passage and answer the questions. (문항 당 1.5점)

Control over the environment is achieved by man when he comes to understand, through experience, the relationship among many of the events in his life--that is, the relative frequency with which two or more phenomena occur jointly. Without such knowledge it would be impossible to make accurate predictions about future events. For example, you come to realize early in your student career that the amount of time spent in studying is related to grades. (1) _____, some students may study many hours and obtain poor grades, while others may achieve high grades despite short study periods. The general trend holds, however; in the majority of cases, you can accurately predict that little or no studying will lead to poor grades while more studying will result in better grades. In statistical terminology, the two variables of hours studying and grades are said to be co-related or *correlated*.

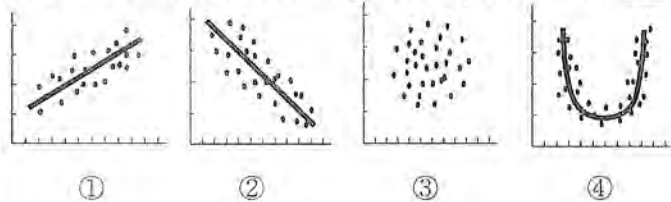
Many pairs of variables are correlated, while many are unrelated or *uncorrelated*. For example, sociologists have found that the incomes of families are positively related to the IQs of the children in the families; the more income, the higher the children's IQs. Thus, these variables are said to be *positively correlated*. This relationship is depicted graphically in (2) Figure 1, which is called a *scatter plot* (or scatter diagram) because

the points scatter across the range of scores. Note that each point on the graph represents two values for one family, income and IQ of the child.

[6] Which of the following fits best in (1) _____?

- ① No ② True ③ Therefore ④ In short

[7] Which of the following best represents (2) Figure 1?



[8-10] Read the following passage and answer the questions. (문항 당 1.5점)

Human brains are the most complex objects in the known universe. Inside each one are some 100 billion nerve cells wired together with a million billion connections. No computer comes close to its complexity, (A) nor does the entire global telecommunications network, which connects only 5 billion mobile phones. In sheer numbers, (B) the brain is just beat by the Milky Way with its 200 billion or more stars, but they are spread across 100,000 light years, not packed into a one-and-a-half-liter capacity skull.

New brain-imaging technology, a sophisticated descendant of the magnetic resonance imaging (MRI) scanners found in many hospitals, is now making it possible to see inside living brains. With support from America's National Institutes of Health, a consortium of scientists around the world is working together on the Human Connectome Project. The goal is to chart the brain's major connections, see how they vary between individuals and figure out which parts of the brain work together in networks, something anatomists could never do by looking at slices of brain under a microscope. In the preliminary phase of the project, scanners have been fine-tuned and programs which visualize their data have been developed to provide brain-connection maps of extraordinary power and beauty. In mid-2012 the excitement will really begin as the first of 1,200 volunteers to have their brains scanned will enter the machines.

The focus on the brain's connections, (C) rather than using scanners to simply look at which areas of the brain light up when we do different tasks, is itself a reflection of a deepening understanding that complex systems are best understood as interactive, dynamic networks which operate as a whole. Olaf Sporns, a theoretical neuroscientist at Indiana University who was the first to propose that the human connectome should be mapped, thinks the project will open up a whole new way of thinking about the brain. "Perhaps we will have in the end a glimpse of the brain that reveals its basic plan," he says. "And the whole structure will be much more understandable (D) than it is now."

[8] Among the underlined parts (A), (B), (C), and (D), which of the following is grammatically NOT correct?

- ① (A) ② (B) ③ (C) ④ (D)

[9] According to the passage, which of the following is true?

- ① The Human Connectome Project is financially supported by Olaf Sporns, who proposed first to study the mapping of a human brain.

- ② The more advanced technology in brain-imaging makes it possible to see the inside of the Milky Way.
- ③ The precise connection map of a human brain will be completed with the MRI machine in mid-2012.
- ④ The number of stars in the Milky Way is twice as large as that of nerve cells in a human brain.
- [10] According to the passage, which of the following is the objective of the Human Connectome Project?
- ① To count the precise number of nerve cells in a human brain
- ② To see the inside of a sliced human brain under the microscope
- ③ To understand more deeply the complicated system of a human brain
- ④ To find out which parts of a human brain respond to certain stimuli

[11-13] Read the following passage and answer the questions. (문항 당 2점)

Most recently, high unemployment in the world's wealthiest nation had cash-strapped Americans avoiding restaurants where beef is a common entree and had them switching to lower cost non-meat dishes at home. USDA estimates 2011 U.S. per capita beef consumption at 57.4 lbs, down 13 percent from 10 years ago and down about 25 percent from 1980. In 2012, USDA predicts, Americans will eat 54.1 lbs of beef on average. The beef industry is coping with these changes by developing new cuts that will satisfy appetites for steaks but at a lower cost. Also, it has benefited from a huge recovery in beef exports particularly to Asia and Russia, where consumers are upgrading their diets and concerns about mad cow disease fade.

Beef companies, like Tyson Foods, JBS, Cargill, and National Beef, are carving up beef carcasses in interesting new ways. Carcass portions that were once meant for ground meat or roasts, such as rounds and chucks, are now sliced into cheaper cuts of steaks for the American palate. These new less expensive steak cuts became popular during the recession and still are, said Chris Calkins, professor of animal science at the University of Nebraska. At the height of the recession the beef industry saw a decline in high-end steak consumption, such as tenderloin and ribeye, in fine dining restaurants. This created an opportunity for beef companies and retailers to promote those higher-end cuts in supermarkets but in smaller portions.

"We have been successful in maintaining sales and item movement by producing smaller and thinner packages of our more expensive beef items," said Karen May, external communications manager for Supervalu, a U.S.-based retail grocery chain. As tough economic times and higher-priced food bite into Americans' grocery budgets consumers look for ways to cut costs. Meat industry experts say Americans still crave the "steak-eating experience" (1) _____ they want it with a cheaper price.

- [11] According to the passage, which of the following is true?
- ① Beef consumptions are gradually decreasing due to the economic recession in the U.S.
- ② Beef companies are trying to provide consumers with new luxurious cuts for higher price.
- ③ Beef items sold in supermarkets are usually cheaper cuts in larger portions than before.
- ④ Beef industries are facing serious problems due to concerns about the mad cow disease in Asia.
- [12] Which of the following fits best in the blank (1)?
- ① as ② because ③ after ④ but
- [13] According to the passage, which of the following is NOT true?
- ① In 1980, an American ate 76.5 lbs of beef.
- ② In 2001, an American ate 70.0 lbs of beef.
- ③ In 2011, an American ate 57.4 lbs of beef.
- ④ In 2012, an American will eat 54.1 lbs of beef.

[14-16] Read the following passage and answer the questions. (문항 당 2.5점)

(A) The lands of Cyprus, Cyrene, and parts of Syria

had been lost; Roman troops were soon to be garrisoned in Alexandria itself. (B) Still, despite drought and famine and the eventual outbreak of civil war, Alexandria was a glittering city compared to provincial Rome. (C) Cleopatra was intent on reviving her empire, not by thwarting the growing power of the Romans but by making herself useful to them, supplying them with ships and grain, and sealing her alliance with the Roman general Julius Caesar with a son, Caesarion. (D)

Lest her subjects resent her Roman overtures, Cleopatra embraced Egypt's traditions. She is said to have been the first Ptolemaic pharaoh to bother to learn the Egyptian language. While it was politic for foreign overlords to adopt local deities and appease the powerful religious class, the Ptolemies were genuinely intrigued by the Egyptian idea of an afterlife. Out of that fascination emerged a hybrid Greek and Egyptian religion that found its ultimate expression in the cult of Serapis--A Greek gloss on the Egyptian legend of Osiris and Isis.

One of the foundational myths of Egyptian religion, the legend tells how Osiris, murdered by his brother Seth, was chopped into pieces and scattered all over Egypt. With power gained by tricking the sun god, Re, into revealing his secret name, Isis, wife and sister of Osiris, was able to resurrect her brother-husband long enough to conceive a son, Horus, who eventually avenged his father's death by slaughtering uncle Seth.

By Cleopatra's time a cult around the goddess Isis had been spreading across the Mediterranean for hundreds of years. To fortify her position, and like other queens before her, Cleopatra sought to link her identity with the great Isis, and to be venerated as a goddess. She had herself depicted in portraits and statues as the universal mother divinity.

- [14] Which is the best slot for the following statement?

By the time Cleopatra VII ascended the throne in 51 B.C. at age 18, the Ptolemaic empire was crumbling.

- ① A ② B ③ C ④ D

- [15] According to the passage, which of the following is NOT true about Cleopatra?
- ① She gave birth to a son for Julius Caesar.
- ② She took advantage of the Isis cult to solidify her status.
- ③ She learned the Egyptian language to please Egyptian gods.
- ④ She was afraid of people's negative opinion about her approach to Rome.
- [16] According to the passage, which of the following is true?
- ① Re helped Osiris to kill Seth.
- ② The cult of Serapis originated from Greece.
- ③ Alexandria was more civilized than Rome at the time.
- ④ Julius Caesar attacked Alexandria to capture Cleopatra.

[17-19] Read the following passage and answer the questions. (문항 당 2.5점)

The prairie is sometimes called sea of grass--a metaphor that points to the endless green expanse and the wavelike motion of the grasses. But there is also a tide in these grasslands--a cycle of growth that sweeps chronologically across the Flint Hills of Kansas, the last great swath of tallgrass prairie in the nation. High tide comes early in the year. The prairie swells into life in early spring, and if fire comes then, the plants respond with a redoubled burst of growth. The fires clear away last year's plant (1) _____, letting in more light and warming the soil.

To the grazers on the hills--bison once and cattle now--the new green on blackened ground is a timely feast. In the cycle of warm-season grasses like big bluestem, this is the peak of their nutritional richness. They continue to grow all through

summer, but as the weeks pass they harden off until, in autumn, their leaves are somber, dried remnants of themselves, crimson, maroon, clattering in the wind.

In most of America, agriculture has meant replacing the incredible complexity of a natural ecosystem with the incredible simplicity of a single crop growing on bare ground. And almost everywhere, fire was the first thing banished, hunted down as relentlessly as if it were a sheep-killing wolf. But in the Flint Hills fire still thrives because the ranchers here depend on a natural ecosystem. Even in the mid-19th century, cattlemen understood that the richness of the Flint Hills grasses depended on a good spring burn--something they learned from the Native Americans they displaced. And so, early each April--even as the cattle that will graze down the prairie are shipping in--the hills go up in smoke.

[17] Which of the following fits best in the blank (1)?

- ① debris ② buds ③ pot ④ ground

[18] According to the passage, which of the following is NOT true?

- ① The prairie is referred to as sea due to its enormous quantity of grass.
② Most American farmers try to avoid fire as much as possible.
③ Agriculture is a complex set of farming activities in America.
④ There will be fire in the Flint Hills next April.

[19] Which of the following topic would come after the passage?

- ① The Flint Hills will soon join the rest of the modern American farmlands in abandoning the use of fire for farming.
② The Flint Hills will witness the Native Americans once again filling its space to teach the conventional farming to Americans.
③ The Flint Hills farmers will continue their traditional way of farming for some time in the future.
④ The Flint Hills cattle will perish in the near future because of the frequent fires set by the farmers.

[20-22] Read the following passage and answer the questions. (문항 당 2.5점)

The horrible nuclear disaster that hit eastern Japan last spring has divided major countries' energy policies into before and after Fukushima. Not Korea, which became the first country in the world to announce candidate sites for additional atomic power plants since March. (A)

Seoul's decision has problems both in its direction and the procedure. Government officials and state-funded scientists say nuclear is the only economically viable alternative to fossil fuels, citing the nation's rapidly increasing energy demand and production costs of major energy sources. They may be right in the short run, (1) _____ the major energy consumers--industry, commerce and households--maintain their wasteful spending patterns. Privately, scientists and environmentalists say, however, nuclear power is neither economical when the heavy costs for dismantling of worn-out plants and disposing of waste fuel is considered nor safe as seen in Chernobyl and Fukushima. Their production cost would then be close to coal plants, but damage from possible accidents can't be compared. (B)

Tokyo says it would take 330 trillion won over 10 years to completely recover from the damage from Fukushima, an amount that could cripple the Korean economy. Officials here virtually rule out chances of an earthquake and tsunami hitting Korea. There are always possibilities of disasters caused by human elements, including corruption, which stopped the operation of two plants recently. When it comes to nuclear plants, even 99.9 percent of safety guarantee is not sufficient. (C)

Experts say Korea can save up to 30 percent of energy consumption if all consumers cooperate, like in Japan, enabling the nation to meet demand without additional atomic plants and

earning time for gradually shifting to safer and cleaner renewable energy. All this indicates the government should have redrawn its energy blueprint based on new demand-supply roadmap, come up with correct, and most conservative, plans for new power stations, and come up with proper allocation by major sources. (D)

[20] Which is the best slot for the following statement?

It didn't. Instead, the government announced the site selection based on its 2008 plan, changing not a figure of it and just waiting half a year until public fear somewhat subdued.

- ① A ② B ③ C ④ D

[21] According to the passage, which of the following is true?

- ① Korea will abandon nuclear power due to recent accidents.
② Nuclear power is the most cost-saving form of energy source.
③ Japanese officials are sure of geographical safety of Korea.
④ You cannot be too cautious in building a nuclear plant.

[22] Which of the following fits best in the blank (1)?

- ① provided ② concerning ③ regarding ④ compared

[23-25] Read the following passage and answer the questions. (문항 당 2.5점)

Cultural historians can often write about the same topics as intellectual historians do. The difference is chiefly methodological: whereas an intellectual historian may investigate a given idea for its own sake, a cultural historian is more likely to examine the cultural circulation of that idea, its diffusion (1) _____ the confines of an intellectual elite and into the wider sphere of society. Whereas intellectual historians frequently limit themselves to understanding the precise conceptual systems developed chiefly by intellectuals themselves, cultural historians tend to be less interested in the finer points of concepts alone and more interested in what happens to such concepts when they are taken up within the realm of public discourse. The difference is sometimes dramatic, sometimes a matter of degree. The historian Dominick La Capra is without question one of the most influential intellectual historians in North America--see, for example, his book on Jean-Paul Sartre. But he is also a cultural historian; indeed, his work stands at the crossroads between intellectual and cultural history: most recently, La Capra has contributed a great deal to our understanding of how the Holocaust and other experiences of historical trauma are conceived, both by intellectuals, but also within cultural "texts" such as literature and film. Carolyn Dean would be another important example of a scholar whose work crosses the cultural-intellectual divide--her official title at Brown University is "Professor of History and Modern Culture and Media." Her work combines theoretical sophistication with marked sensitivity to the way that complex ideas (about, e.g., homosexuality, selfhood, pleasure, and empathy) are integrated into broader patterns of cultural fantasy and representation. There are many other scholars whose works illustrate a similar ingenuity in combining intellectual and cultural methodologies. Overall, it is fair to say that some of the most path breaking and creative work in recent years lies precisely at the (2) _____ of intellectual and cultural history.

[23] Which of the following fits best in the blank (1)?

- ① by ② beyond ③ as ④ concerning

[24] According to the passage, which of the following is true?

- ① Only a few scholars are interested in the relation between ideas and culture.
② Intellectual historians tend to devote greater attention to the circulation of ideas than cultural historians.
③ The line between cultural history and intellectual history is strictly distinguished.
④ La Capra's recent study of the Holocaust reflects methodologies of both intellectual history and cultural history.

[25] Which of the following fits best in the blank (2)?

- ① intersection ② division ③ circulation ④ representation

[26] $\lim_{x \rightarrow \pi} \frac{\cos x + \cos 2x}{1 + \cos x}$ 의 값은? (1.6점)

- ① 1 ② -3 ③ 3 ④ 5

[27] $\sinh x = \frac{1}{2}$ 일 때, $\tanh x$ 의 값은? (1.6점)

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

[28] 정적분 $\int_0^{100} (2x - [x]) dx$ 의 값은? ($[x]$ 는 x 를 넘지 않는 최대정수이다.) (1.6점)

- ① 4500 ② 4950 ③ 5050 ④ 5500

[29] 다음 함수 f 가 모든 x 에서 연속일 때 상수 a 의 값은? (1.8점)

$$f(x) = \begin{cases} \frac{x-2}{\sqrt{x^2+5}-3}, & x < 2 \\ ax+2, & x \geq 2 \end{cases}$$

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

[30] 정적분 $\int_0^3 \frac{x}{\sqrt{x+1}} dx$ 의 값은? (1.8점)

- ① $\frac{4}{3}$ ② $\frac{8}{3}$ ③ 2 ④ 3

[31] 두 곡선 $y = \tan x + \sin 2x$ 와 $y = a \tan^{-1} x + 2x$ 가 원점에서 접선이 같을 때 상수 a 의 값은? (1.8점)

- ① 1 ② 2 ③ -1 ④ -2

[32] $\lim_{x \rightarrow 0} (\cos x + 3x)^{\frac{2}{x}}$ 의 값은? (1.8점)

- ① e ② e^2 ③ e^3 ④ e^6

[33] 무한급수에 대하여 옳지 않은 것은? (2.0점)

- ① $\sum_{n=1}^{\infty} a_n$ 이 수렴하면 $\lim_{n \rightarrow \infty} a_n = 0$ 이다.
 ② $\lim_{n \rightarrow \infty} |a_n|^{\frac{1}{n}} = \frac{1}{2}$ 이면 $\sum_{n=1}^{\infty} a_n$ 은 수렴한다.
 ③ $\sum_{n=1}^{\infty} |a_n|$ 이 수렴하면 $\sum_{n=1}^{\infty} a_n$ 도 수렴한다.
 ④ $\sum_{n=1}^{\infty} a_n$ 이 수렴하면 $\sum_{n=1}^{\infty} a_n^2$ 도 수렴한다.

[34] 다음 무한급수 중에서 발산하는 것은? (2.0점)

- ① $\sum_{n=1}^{\infty} \frac{1}{n!}$ ② $\sum_{n=1}^{\infty} \frac{(n+1)^2}{2^n}$
 ③ $\sum_{n=1}^{\infty} \frac{n}{\sqrt{n^3+1}}$ ④ $\sum_{n=1}^{\infty} \frac{(-1)^n n}{n^2+1}$

[35] 멱급수 $\sum_{n=0}^{\infty} \frac{(3x-2)^n}{5^n \sqrt{n+1}}$ 에서 수렴하는 정수 x 의 개수는? (2.0점)

- ① 1개 ② 2개 ③ 3개 ④ 4개

[36] 평면영역 $D = \{(x, y) \mid x \geq 0, y \leq 2, 2y \geq x\}$ 에서

$\iint_D (3x^2 - ay) dA = 0$ 일 때, 상수 a 의 값은? (2.0점)

- ① 3 ② 6 ③ 8 ④ 10

[37] $f(x) = \int_1^{1+2x} \frac{t^2}{\sqrt{1+t^2}} dt$ 일 때, 미분계수 $f'(0)$ 의 값은? (2.0점)

- ① 1 ② $\sqrt{2}$ ③ $\sqrt{3}$ ④ 0

[38] 평면영역 $D = \{(x, y) \mid (x-1)^2 + y^2 \leq 1\}$ 에서 $\iint_D f(x, y) dA$

의 계산식은? (2.0점)

- ① $\int_{-\pi/2}^{\pi/2} \int_0^{2\cos\theta} f(r\cos\theta, r\sin\theta) r dr d\theta$
 ② $\int_{-\pi/2}^{\pi/2} \int_0^{2\sin\theta} f(r\cos\theta, r\sin\theta) r dr d\theta$
 ③ $\int_0^{\pi} \int_0^{2\cos\theta} f(r\cos\theta, r\sin\theta) r dr d\theta$
 ④ $\int_0^{\pi} \int_0^{2\sin\theta} f(r\cos\theta, r\sin\theta) r dr d\theta$

[39] 공간에서 두 점 $P(1, 3, 2)$, $Q(-1, 2, 0)$ 을 양 끝점으로 하는 선분 PQ 와 만나는 평면의 방정식은? (2.0점)

- ① $3x - z = 0$ ② $x + 2y - z = 0$
 ③ $-x + 2y + z = 0$ ④ $x + y + z = 0$

[40] 곡선 $g(x, y) = 0$ 위의 점 $P(2, 3)$ 에서 접선이 $y = -2x + 7$ 이다. $g_x(2, 3) = 1$ 일 때, $g_y(2, 3)$ 의 값은? (2.0점)

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

[41] 다음 이상적분 중에서 값이 유한한 것의 개수는? (2.0점)

$$\int_0^{\infty} \frac{1}{1+x^2} dx, \quad \int_0^1 \frac{1}{\sqrt{x}} dx, \quad \int_1^{\infty} \frac{1}{x+e^x} dx, \quad \int_2^{\infty} \frac{1}{x \ln x} dx$$

- ① 1개 ② 2개 ③ 3개 ④ 4개

[42] 곡선 $y = 2e^x$, 원점을 지나는 이 곡선의 접선, y 축으로 둘러싸인 영역의 넓이는? (2.0점)

- ① $2e$ ② $e - 1$ ③ $2e - 1$ ④ $e - 2$

[43] 곡면 $2x + y^2 - z = 2$ 위의 점 $(1, 1, 1)$ 에서의 법선벡터가 y 축과 이루는 예각을 θ 라 할 때, $\cos\theta$ 의 값은? (2.0점)

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

[44] $\lim_{n \rightarrow \infty} \frac{1}{n^2} \left(\sqrt{\frac{1}{n}} + 2\sqrt{\frac{2}{n}} + \dots + n\sqrt{\frac{n}{n}} \right)$ 의 값은? (2.0점)

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

[45] $z = f(x, y)$ 에서 $f_x(1, 3) = 5$, $f_y(1, 3) = 3$ 이다.

$g(x) = f(x, 4x - x^2)$ 일 때, 미분계수 $g'(1)$ 의 값은? (2.0점)

- ① 8 ② 11 ③ 12 ④ 14

[46] 곡선 $y = x^3$ 과 직선 $y = 3x + k$ 가 2개 이상의 교점을 갖도록 하는 정수 k 의 개수는? (2.0점)

- ① 3개 ② 4개 ③ 5개 ④ 6개

[47] 포물선 $y = x - x^2$ 과 직선 $y = -x$ 으로 둘러싸인 영역을 y 축을 중심으로 회전시킬 때 생기는 회전체의 부피는? (2.5점)

- ① $\frac{2\pi}{3}$ ② $\frac{4\pi}{3}$ ③ $\frac{5\pi}{6}$ ④ $\frac{8\pi}{3}$

[48] 원점에서 직선 $-x + 2 = y - 2 = \frac{z+3}{2}$ 까지의 최단거리는?

(2.5점)

- ① 3 ② $\sqrt{10}$ ③ $\sqrt{11}$ ④ $2\sqrt{3}$

[49] $f(x) = \frac{x \sin x}{2+x^2}$ 일 때, $f^{(4)}(0)$ 의 값은? (2.5점)

- ① $\frac{1}{3}$ ② $-\frac{4}{3}$ ③ -8 ④ -32

[50] $x \geq 0$ 에서 $f(x) = \frac{1}{2}(x^3 + x)$ 이다. f 와 f^{-1} 가 나타내는 두 곡선으로 둘러싸인 영역의 넓이는? (2.5점)

- ① $\frac{1}{3}$ ② $\frac{1}{4}$ ③ $\frac{1}{8}$ ④ $\frac{3}{8}$