

Ⅰ 次の空所を埋めよ。(配点 40)

(1) $\sqrt{10}$ の小数部分を a とするとき, $a + \frac{1}{a} = \boxed{\text{ア}}$ である。

(2) 2 次関数 $y = x^2 - 2mx + 3m + 4$ のグラフが x 軸と共有点をもたないような
定数 m の値の範囲は $\boxed{\text{イ}} < m < \boxed{\text{ウ}}$ である。

(3) 直線 $3x + 4y - 12 = 0$ 上の点 P と点 $(3, 4)$ との距離の最小値は $\boxed{\text{エ}}$ である。
そのとき, 点 P の x 座標は $\boxed{\text{オ}}$ である。

(4) 不等式 $\left(\frac{1}{2}\right)^{3x} > 4^{x-5}$ を満たす x の値の範囲は $\boxed{\text{カ}}$ である。

(5) $\int_0^2 |x-1|dx = \boxed{\text{キ}}$ であり, $\int_0^2 (x^2 - |x-1|)dx = \boxed{\text{ク}}$ である。

Ⅱ 次の空所を埋めよ。(配点 30)

(1) 三角関数の加法定理より,

$$\cos(\alpha - \beta) - \cos(\alpha + \beta) = 2 \sin \alpha \sin \beta, \quad \sin(\alpha + \beta) + \sin(\alpha - \beta) = 2 \sin \alpha \cos \beta$$

となる。これを利用すると,

$$\sin \frac{5}{12}\pi \sin \frac{1}{12}\pi = \boxed{\text{ア}}, \quad \sin \frac{5}{12}\pi + \sin \frac{1}{12}\pi = \boxed{\text{イ}}$$
 である。

(2) したがって, $\sin \frac{5}{12}\pi$ と $\sin \frac{1}{12}\pi$ を解にもつ 2 次方程式の 1 つは $\boxed{\text{ウ}}$ となる。

(3) (2) の 2 次方程式を解くことにより, $\sin \frac{5}{12}\pi = \boxed{\text{エ}}$, $\sin \frac{1}{12}\pi = \boxed{\text{オ}}$ を得る。

Ⅲ 関数 $f(x) = 2x^3 - 3x^2 - 12x + 15$ について, 次の問いに答えよ。(配点 30)

(1) $f(x)$ を微分せよ。

(2) $f(x)$ の増減を調べ, 極値を求めよ。

(3) 区間 $1 \leq x \leq 3$ における $f(x)$ の最大値と最小値を求めよ。

Ⅰ 次の英文は、Yumiko が自分の家の夏みかん(*natsumikan*)の木について書いたものである。
英文を読み、下記の設問に答えよ。（配点 24）

“I need vitamin C! Can you make that special drink?” When one of my children says this, I head out to our garden with a pair of scissors and return with apron pockets bulging with fresh fruit. Our family has a large *natsumikan* tree in our garden [1] was planted more than 40 years ago. During the first six months of the year, we can pick the fruit whenever we wish. As the tree is very big, fruit can be picked from the street, too.

One time, upon [2] home, I saw a man standing on his bike and picking the fruit, with his backpack full of *natsumikan*. When he saw me, he suddenly disappeared.

Another time, somebody rang our doorbell, and when I went to see who it was, I saw a man holding a paper bag. He said he had made pastries with marmalade made out of our *natsumikan* and wanted to give us some. I was a little [3], as it was the first time I had ever seen him.

An elderly woman who lived nearby until last year, used to bring me a large jar of her homemade marmalade made with our *natsumikan* every year, even when I forgot to give her the fruit. One time I asked her how she got them, as she is very short, which would make it difficult for her to pick the fruit.

Smiling, she told me that after a storm or strong winds, she could pick fresh *natsumikan* right off the ground. Although I never noticed her in our garden picking them up, I was more than happy in her case for her to have them.

The “special drink,” which is very popular with my children and their friends, is a mixture of freshly squeezed *natsumikan* juice and cold milk sweetened with honey or sugar. When the two are mixed, the drink becomes creamy and tastes like yogurt.

This year, our *natsumikan* fruits have grown as big as grapefruits and weigh about 450 grams each! As it would be dangerous if they fell and (1) someone (2) hit (3) the (4) on) head, my husband and I decided to harvest them last week. I squeezed a lot of juice and made many jars of marmalade.

(Taste of Home by Tamako Sakamoto, The Daily Yomiuri, May 11, 2012)

(1) 空所 [1] ～ [3] に入る最も適切なものを、次の中からそれぞれ1つ選び、その番号をマークせよ。

- | | | | | |
|-----|-------------|------------|-------------|------------|
| [1] | ① where | ② whose | ③ who | ④ that |
| [2] | ① arrive | ② arriving | ③ to arrive | ④ arrived |
| [3] | ① confusing | ② confuse | ③ confusion | ④ confused |

(2) 本文の内容と合うものを、次の中から2つ選び、その番号をマークせよ。ただし解答の順序は問わない。

- ① The *natsumikan* tree at Yumiko's house cannot be seen from the street at all.
- ② An elderly woman said she made marmalade out of *natsumikan* blown off the trees by a strong wind.
- ③ The elderly woman still lives in Yumiko's neighborhood.
- ④ Yumiko was angry that the elderly woman had lied to her about her *natsumikan*.
- ⑤ The special drink Yumiko makes is a mixture of *natsumikan* juice and yogurt with honey or sugar.
- ⑥ Yumiko's children do not like the special drink of *natsumikan* at all.
- ⑦ This year Yumiko and her husband were afraid that someone might be injured by their *natsumikan*.

(3) 下線部 {① someone ② hit ③ the ④ on} の①～④を並べ替えて英文を完成し、3番目にくるものの番号をマークせよ。

II 次の会話を読んで、下記の設問に答えよ。(配点 24)

- Bob: What shall we have for dinner tonight?
Brenda: I'm not sure. Why don't we eat out? I don't really feel like cooking today.
Bob: Great. What kind of food do you want eat?
Brenda: I don't mind. I can eat anything. You decide.
Bob: How about Italian? We could go to Alfredo's.
Brenda: But I cooked pasta yesterday. Let's try something different.
Bob: Oh yes. OK. What Chuck's Steak House?
Brenda: I heard there's a new Vietnamese restaurant opened town.
Bob: Let's go there then.
Brenda: OK. What time shall we go? I think we should reserve a table just in case.
Bob: Seven. Then we can be back in time for sports on TV.
Brenda: But I have to do something with my hair.
Bob: Seven thirty then.
Brenda: I might go and get my nails done as well.
Bob: OK. How does eight thirty sound?
Brenda: Yes, that's good for me. I'll call and reserve a table.

(1) Select the correct word to fill in to .

- | | | | | |
|--------------------------------|---------|-------|------|--------|
| <input type="text" value="7"/> | ① by | ② for | ③ to | ④ with |
| <input type="text" value="8"/> | ① about | ② for | ③ in | ④ with |
| <input type="text" value="9"/> | ① for | ② in | ③ on | ④ with |

(2) Where will Bob and Brenda eat dinner?

- ① an Italian restaurant ② a steak house ③ a Vietnamese restaurant ④ a sushi bar

(3) Why can't they eat at seven?

- ① Because Bob wants to watch sports on TV.
② Because Brenda has to get ready.
③ Because they must reserve a table.
④ Because Brenda cooked dinner yesterday.

(4) What does 1) I might go and get my nails done as well mean? 12

- ① I will reserve a table at the Vietnamese restaurant and then go and get my nails done.
- ② I will do something with my hair and might go and get my nails done.
- ③ I cooked dinner last night and I have to get my nails done, too.
- ④ I don't feel like cooking today so I might go and get my nails done.

(5) Which sentence has the same meaning of call as in 2) I'll call and reserve a table?

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- ① My dog is called Rusty.
- ② I called in at Mary's house on the way home to see if she needed anything.
- ③ I called a taxi to go to the airport.
- ④ He was the only one who called the unexpected victory.

- Ⅲ 次の会話を完成するために、空所に入る最も適切なものをそれぞれ1つ選び、その番号をマークせよ。(配点 20)

〈At a travel agency〉

Agent: Good morning. Can I help you?

Paul: Yes, please. I'd like to book a trip to Montreal.

Agent: To Montreal, certainly. For how many, sir?

Paul: 14 We're going to celebrate our engagement.

Agent: How wonderful! Congratulations! For two, then. Now, 15 are you thinking of?

Paul: Well, from around October 7 for a week, if possible at all.

Agent: Fine, from October 7. 16 Let's see ... It's Friday. The fare is less for a Thursday flight than for a Friday one. Which would you prefer?

Paul: We'll take the Thursday departure.

- 14 ① My fiancée and me. Just two of us.
② Not my fiancée.
③ As many as possible.
④ Two out of four.

- 15 ① which airline
② from which airport
③ which day of the week
④ what dates

- 16 ① Which airline would you prefer to take?
② How often do you fly on Thursday?
③ Which day of the week is it going to be?
④ What time would you like to leave?

〈At a station〉

Kaori: Excuse me. You seem lost. Can I be of any help?

Vicki: Oh yes, please. I'd like to go to Doshishamae Station. This is Kitashinchi Station, isn't it?

Kaori: From this Kitashinchi Station to Doshishamae, you need to take the 18:42 rapid train for Kizu. It leaves from Platform 1, not 2.

Vicki: Platform 1. That's great. Thanks a lot.

- ① I'm afraid not.
② That's correct.
③ Yes, it means this.
④ No. What a pity!

Ⅳ それぞれの英文を完成させるのに正しい語句を選び、その番号をマークせよ。(配点 8)

Why don't we take two (① sandwiches ② sandwiches ③ sandwich) each for the picnic?

Can you try making two equal (① half ② halves ③ halves)?

Do you have any shoes for this baby's little (① foots ② footes ③ feet)?

Have you heard (① many news ② a few newses ③ any news) from your brother?

V 次の英文を読み、下記の設問に答えよ。(配点 24)

Everyone graduates from high school knowing how to read, write and do basic math. But to be a self-sufficient adult, those skills are not enough. In fact, they're nowhere close to enough. Advanced skills in academic areas aren't going to help young adults with every problem they are likely to face in the next few years. What will they do when their cars break down or they get sick? Do they know how to navigate a job interview or a lunch with coworkers? Are they responsible with money? Schools teach many of these skills, either directly or woven into other academic subjects. But it's [22] to parents to make sure their *teens can take care of themselves in the world. Here are some of the skills educators think are crucial to becoming an adult and how to teach them to your teens.

***Budgets and money:** It's important for teens to know how interest works and how to track their bank accounts online. "Make sure your teens have their own bank accounts, and if they don't, take them to the bank to open one," says the chairman of the Children's Financial Network. "It is important for kids to know how to use the bank in person before they start managing accounts online." Help young teens practice managing money by giving them a clothing budget. Have them come up with a list of what they need, where they will buy the clothes and how much they will cost. Then go over the budget and make *adjustments as necessary.

Managing time: Teens should be able to use a personal calendar by the [23] they graduate, the principal of a high school said, in order to remember appointments and important dates. Have them start using a calendar *app or an online calendar [24] they are still in high school to get them in the habit of keeping track of everything, he said. The earlier they start, the better.

[25] : Some basic home skills such as taking care of your *laundry may seem simple, but they are not. Teach your teen not only how to sort out laundry but also how much *detergent to use, how to treat stains and how many items of clothing to put in the washer at a time.

(Teach Your Teens Basic Skills by Mari-jane Williams (The Washington Post), The Japan Times, Feb 4, 2013)
("Life Skills All Teens Should Have Before Graduating From High School" from The Washington Post; 1/23/2013(c)
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|---|-----------------------|--------------|-----------------|
| 注 | *teens 13 歳から 19 歳の若者 | *budgets 予算 | *adjustments 調整 |
| | *app—application | *laundry 洗濯物 | *detergent 洗剤 |

- (1) 空所 22 ～ 24 に入る最も適切なものを、次の中からそれぞれ1つ選び、その番号をマークせよ。

22	① in	② on	③ along	④ up
23	① time	② when	③ way	④ how
24	① despite	② during	③ while	④ between

- (2) 見出し 25 に入る適切なものを、次の中から1つ選び、その番号をマークせよ。 25

- ① Treating other people with respect
- ② Running a household
- ③ Digital kids, analog skills
- ④ Handling emergencies

- (3) 第2段落の下線部 one はどのような語句の代わりに用いられているか。次の中から1つ選び、その番号をマークせよ。 26

- ① interest ② an account ③ a bank ④ budget

- (4) この英文全体につけるタイトルとして最も適切なものを、次の中から1つ選び、その番号をマークせよ。 27

- ① Teach your teens basic life skills
- ② Taking your teens to the insurance agent
- ③ All kids need to have some public-speaking abilities
- ④ How to communicate with others

- (5) 本文の内容に合わないものを、次の中から1つ選び、その番号をマークせよ。 28

- ① 13 歳から 19 歳の若者が利子の仕組みを知っていることは大切である。
- ② 13 歳から 19 歳の若者が銀行の利用方法を知っていることは重要である。
- ③ 13 歳から 19 歳の若者がカレンダーのソフトを使い始めるのは、早ければ早いほど良い。
- ④ 13 歳から 19 歳の若者が銀行に口座を開く必要はない。