Math Examination (Sample)

< Multiple choice Types > There is only one correct answer per each question. Mark your answer choice on the OMR answer sheet.

○ For each correct answer, you will get the points indicated next to each question number.

○ No penalty point is applied to an incorrect answer.

1. Compute $\log_3 \sqrt{108} + \log_{\frac{1}{9}} 4 + 2^{\log_{\frac{1}{2}} 3}$.

① $\dfrac{5}{6}$ ② $\dfrac{7}{6}$ ③ $\dfrac{11}{6}$

④ $\dfrac{13}{6}$ ⑤ $\dfrac{17}{6}$

2. Compute $\sin \dfrac{13\pi}{12}$.

① $\dfrac{1-\sqrt{6}}{4}$ ② $\dfrac{\sqrt{2}-\sqrt{6}}{4}$ ③ $\dfrac{\sqrt{3}-\sqrt{6}}{4}$

④ $\dfrac{\sqrt{4}-\sqrt{6}}{4}$ ⑤ $\dfrac{\sqrt{5}-\sqrt{6}}{4}$

3. When $\begin{pmatrix} 1 & 3 \\ 0 & -1 \end{pmatrix}^{-1} \begin{pmatrix} -2 & 2 \\ 1 & 1 \end{pmatrix} = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$,

find $a+b+c+d$.

① 4   ② 5   ③ 6   ④ 7   ⑤ 8

4. When $\omega = \dfrac{1+\sqrt{3}\,i}{\sqrt{2}}$, find ω^{30} .

① 2^6 ② 2^9 ③ 2^{12} ④ 2^{15} ⑤ 2^{18}

5. Find the maximum value of $f(x) = \dfrac{x}{x^2+3}$.

① $\dfrac{1}{4}$ ② $\dfrac{\sqrt{2}}{5}$ ③ $\dfrac{\sqrt{3}}{6}$ ④ $\dfrac{2}{7}$ ⑤ $\dfrac{\sqrt{5}}{8}$

6. Find the area of the region enclosed by $y = x^5 + 2x^4 + x^2 - 1$ and $y = x^5 + 2x^4 + x + 1$.

① $\dfrac{1}{2}$ ② $\dfrac{3}{2}$ ③ $\dfrac{5}{2}$ ④ $\dfrac{7}{2}$ ⑤ $\dfrac{9}{2}$