

数学

◀工学部 (社会環境工 (環境情報コース)・生命工)▶

1 解答

(1) 頂点: $(m+2, 3m^2+m-4)$, $-\frac{4}{3} < m < 1$

(2) $S=4\sqrt{3}$, $V=\frac{16\sqrt{2}}{3}$

(3) 平均値: 8, 分散: 18

2 解答

(1) $a^{\frac{3}{2}}+a^{-\frac{3}{2}}=98$, $a^3+a^{-3}=9602$ (2) $S=\frac{125}{6}$

(3) $0 \leq x < \frac{\pi}{6}$, $\frac{\pi}{2} < x < \frac{7}{6}\pi$, $\frac{3}{2}\pi < x < 2\pi$

3 解答

(1) $I(t) = -(t+1)e^{-t} + 1$ (2) $\lim_{x \rightarrow \infty} f(x) = 0$ (3) $\lim_{t \rightarrow \infty} I(t) = 1$

4 解答

(1) $p_1 = \frac{5}{6}$, $p_2 = \frac{5}{9}$ (2) $q_1 = \frac{5}{12}$ (3) $q_2 = \frac{5}{9}$

5 **解答**

(1) $\overrightarrow{AB} = (-2, -2)$, $\overrightarrow{AC} = (6, -6)$

(2) $\overrightarrow{BC} = (8, -4)$, $\overrightarrow{BE} = \left(\frac{4}{5}, -\frac{2}{5}\right)$ (3) $\overrightarrow{OD} = \left(-\frac{12}{5}, -\frac{14}{5}\right)$