

14.8 Lagrange Multipliers

◎ 填充題

1. The maximum of $f(x, y, z) = xy + z^2$ on the intersection of $y - x = 0$ and $x^2 + y^2 + z^2 = 4$ is _____.

Ans: 4 [99 學年度]

2. The **maximum** value of $f(x, y, z) = x^2yz + 1$ on the intersection of the plane $z = 1$ with the sphere $x^2 + y^2 + z^2 = 10$ is _____.

Ans: $1 + 6\sqrt{3}$ [100 學年度]

3. The plane $x + y + 2z = 2$ intersects the paraboloid $z = x^2 + y^2$ in an ellipse. The **point** on this ellipse that is farthest from the origin is _____.

Ans: $(-1, -1, 2)$ [101 學年度]

4. The **shortest distance** between the points on the surface $S: x^3y^2z = 2$ and the origin is _____.

Ans: $\sqrt{2\sqrt{3}}$ [102 學年度]