

1. 求  $\frac{dy}{dx}$ ,  $6x^2 + 8xy + y^2 = 100$

2. 求  $\frac{dy}{dx}$  (at  $x=-1, y=1$ ),  $x^2y^2 - xy = 2$

3. 微分  $f(x) = 2x^3 - 3xe^{2x}$ ,  $f(x) = \ln \sqrt{x^2+1}$

4. 積分  $\int (\frac{1}{x^2} + \frac{1}{x} + e^{-x}) dx$ ,  $\int_1^9 (x - \frac{1}{\sqrt{x}}) dx$

5. Find the area under the curve between the given  $x$ -values

$$f(x) = e^{x/2}, \quad x=0 \text{ to } 4$$

6. Find the area bounded by the following pair of curves

$$y = e^x, \text{ and } y = x + 5$$

7. An artist wants to paint the interior of the shape shown below on

the side of a building. How much area (in square meters) will the artist need to paint?