

# 高等数学学习题课

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1. Let  $y = e^{\sin(2x)} \ln(1 - x^2)$ , find  $y'$ .

2. Let  $f(t) = \lim_{x \rightarrow \infty} t(1 + \frac{1}{x})^{2tx}$ , find  $f'(t)$ .

3. Let  $f = xf(\sin(x))$  be a differentiable function, find  $y'$ .

4. Let  $y = \ln \sqrt{\frac{1+x}{1-x}}$ , find  $y'$ .

5. Let

$$f(x) = \begin{cases} \frac{x}{1-e^{1/x}} & x \neq 0 \\ 0 & x = 0, \end{cases}$$

find  $y'$ .

6. Let function  $f(x) = x|x(x - 2)|$ , find  $f'(x)$ .

7. Suppose function  $y = y(x)$  is determined by equation  $y - 2x = (x - y)\ln(x - y)$ , find  $y''(0)$ .



Thank you!