

导数运算

一、解答题

1. 求下列函数的导数.

$$(1) f(x) = x \cos x - \sin x;$$

$$(2) f(x) = \frac{3x}{x-1};$$

$$(3) f(x) = \ln \frac{1+x}{1-x}.$$

2. 求下列函数的导数:

$$(1) y = x^4 - 3x^2 - 5x + 6;$$

$$(2) y = 2^x + \sin \frac{x}{2} \cos \frac{x}{2};$$

$$(3) y = x - \log_2 x;$$

$$(4) y = \frac{\cos x}{x};$$

$$(5) y = \frac{3x^2 - x\sqrt{x} + 5\sqrt{x} - 9}{\sqrt{x}}.$$

3. 求下列函数的导数

$$(1) f(x) = x^2 \ln x + \sin x$$

$$(2) f(x) = \frac{e^x}{x-1}$$