

科目：微積分

適用：經濟系(經濟分析組)

考生注意：

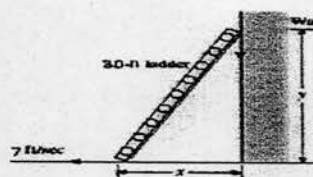
1. 依次序作答，只要標明題號，不必抄題。
2. 答案必須寫在答案卷上，否則不予計分。
3. 限用藍、黑色筆作答；試題須隨卷繳回。

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1.(10%) Let  $f$  be the function defined by  $y = f(x) = 4x^2 - 6x + 8$ . Find the approximate change in  $y$  if  $x$  changes from 2 to 2.05.

2.(20%) A 30-ft ladder leaning against a wall begins to slide. How fast is the top of the ladder sliding down the wall at the instant of time when the bottom of the ladder is 18 ft from the wall and sliding away from the wall at the rate of 7 ft/sec?



3.(10%) A Find the general solution of the differential equation  $\frac{dy}{dx} = \frac{1}{(x+1)y^2}$ .

4.(30%) Find the indefinite integral.

a.  $\int x \ln(x+7) dx$

Hint: First, make the substitution  $u = x + 7$ ; then, integrate by parts.

b.  $\int x^2 \ln 5x dx$ .

c.  $\int x^2 e^{-3x} dx$ .

5.(30%) Find the derivative of the function.

a.  $f(x) = \left(\frac{6x+7}{5x-2}\right)^5$

b.  $g(x) = \ln|8x-9|$

c.  $h(x) = x^2(2x+3)(5x+5)$