

除了選擇, 填充和簡答題之外, 你的答案必須提供完整說明, 如果只有答案沒有任何說明得零分!

1. (5+5=10 points) (a) Sketch the graph of  $f(x) = e^{|x|}$ . Is it a one-to-one function?

Why or why not?

(b) Find the inverse function  $g^{-1}(x)$  of  $g(x) = \ln(x+3)$ .

2. (5+5=10 points) Solve for  $x$ : (a)  $e^{2x} - 3e^x + 2 = 0$

(b)  $1 - 2 \ln x < 3$

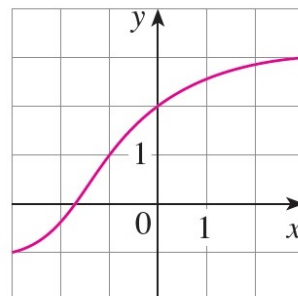
3. (4+3+3=10 points) 簡答題.

The graph of  $f$  is given.

(a) What are the domain and range of  $f^{-1}$ ?

(b) What is the value of  $f^{-1}(2)$ ?

(c) What is the value of  $f^{-1}(-1)$ ?



4. (5+5=10 points) If  $f(x) = e^x \sin x$ , find  $f'(x)$  and  $f''(x)$ .

5. (10 points) Find an equation of the tangent line to the curve  $y = x\sqrt{x}$  that is parallel to the line  $y = 1 + 3x$ .)

6. (5+5=10 points) Find the derivatives:

(a)  $y = (x + 2\sqrt{x})e^x$

(b)  $f(x) = \frac{5t}{t^3 - t - 1}$