

**P.O.C.A. WONG SIU CHING SECONDARY SCHOOL**  
**PURE MATHEMATICS**  
**CALCULUS : DERIVATIVES**  
**ASSIGNMENT 16A**

Date	Name	Grade / Score
		<b>/15</b>

1. Find the derivative of  $f(x) = \begin{cases} x^3 & \text{if } x \geq 0, \\ x^2 & \text{if } x < 0 \end{cases}$ .

2. Find the derivative of  $f(x) = x^2|x|$ .

3. Let  $f(x) = \begin{cases} x^3 \sin \frac{1}{x} & \text{if } x \neq 0 \\ 0 & \text{if } x = 0 \end{cases}$ .

(a) Show that  $f$  is differentiable at 0.

(b) Find  $f'(x)$ .

(c) Is  $f'$  continuous at 0?