

True/False

1. Every differentiable is function continuous.
2. Every continuous is function differentiable.
3. The function  $|x|$  is differentiable at  $x=0$ .
4. The function  $|x|$  is continuous at  $x=0$ .
5. The greatest integer function  $[x]$  is a continuous function on  $\mathbb{R}$ .

Fill in the blanks:

1. The function  $|x|$  is differentiable at  $x=$ .....

2. The function  $f:\mathbb{R}$  to  $\mathbb{R}$  defined as

$$f = \begin{cases} 2x-3 & , x \geq 0 \\ -3 & , x < 0 \end{cases} \text{ is ..... at } x=0.$$

3. The function  $f:\mathbb{R}$  to  $\mathbb{R}$  defined as

$$f = \begin{cases} \frac{|x-3|}{x-3} & , x \geq 3 \\ 1 & , x < 3 \end{cases} \text{ is ..... at } x=3.$$

4. The function  $f:\mathbb{R}$  to  $\mathbb{R}$  defined as

$$f = \begin{cases} \frac{|x-3|}{x-3} & , x < 3 \\ \frac{|x-3|}{x-3} & , x \geq 3 \end{cases} \text{ is ..... at } x=3.$$

5. The function  $f:\mathbb{R}$  to  $\mathbb{R}$  defined as

$$f = \begin{cases} \frac{\sin x}{x} & , x \neq 0 \\ 1 & , x = 0 \end{cases} \text{ is ..... at } x=0.$$