

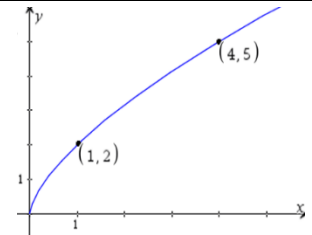
## Warm up Skills Topics 2.1-2.4 – The Definition of the Derivative

For Problem 1 & 2, the given limits represent an  $f'(c)$  for a function  $f(x)$  and a number  $c$ . Find  $f$  and  $c$ .

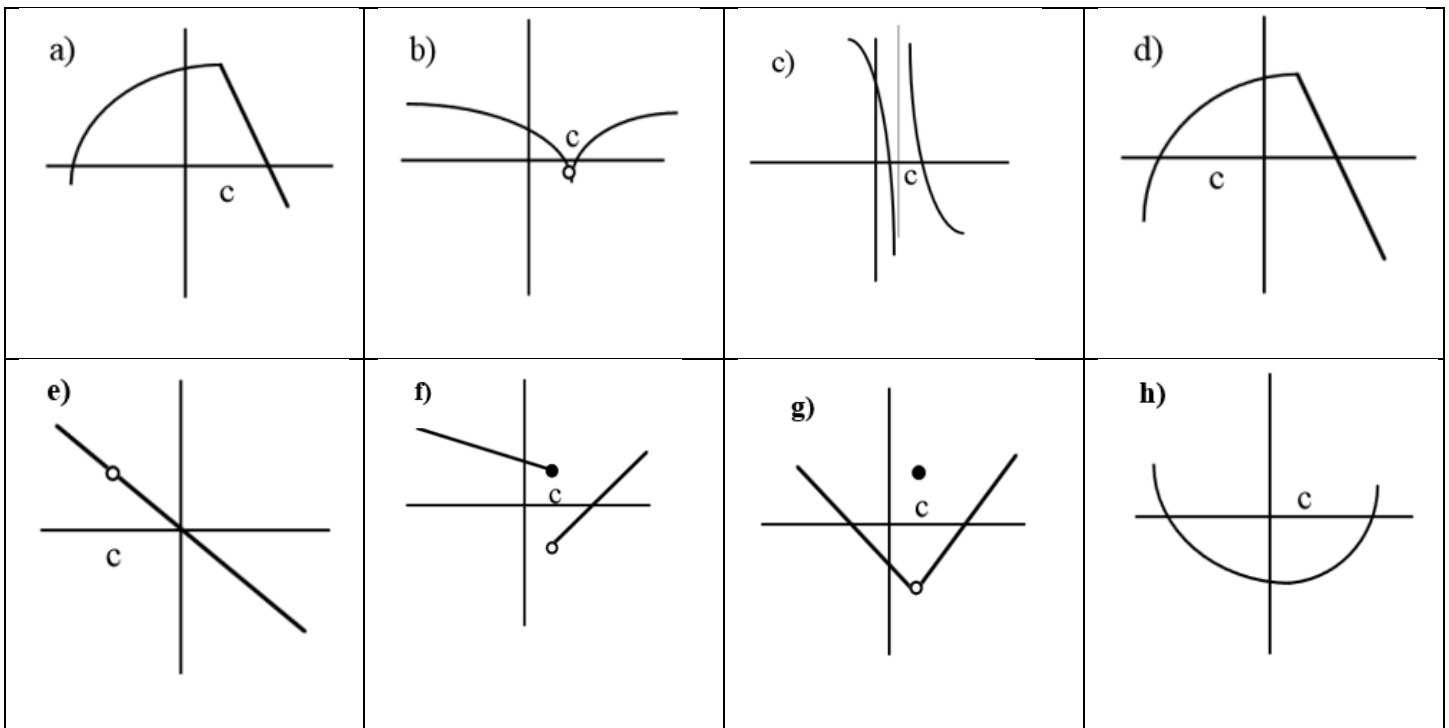
1.  $\lim_{\Delta x \rightarrow 0} \frac{[5-3(1+\Delta x)]-2}{\Delta x}$

2.  $\lim_{h \rightarrow 0} \frac{(-2+h)^3+8}{h}$

3. What does the equation  $y = \frac{f(4)-f(1)}{4-1}(x-1) + f(1)$  represent? Find the equation.



4. For the following, state whether the function is continuous, differentiable, both or neither at  $x = c$ .



5. Given the function,  $f(x) = x^3 + kx$ , and the line,  $y = 6x - 2$ , find the value of  $k$  so that the line is tangent to the function.