

Group Names and Student Numbers (minimum of two names required for participation to be recorded):

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_  
 \_\_\_\_\_

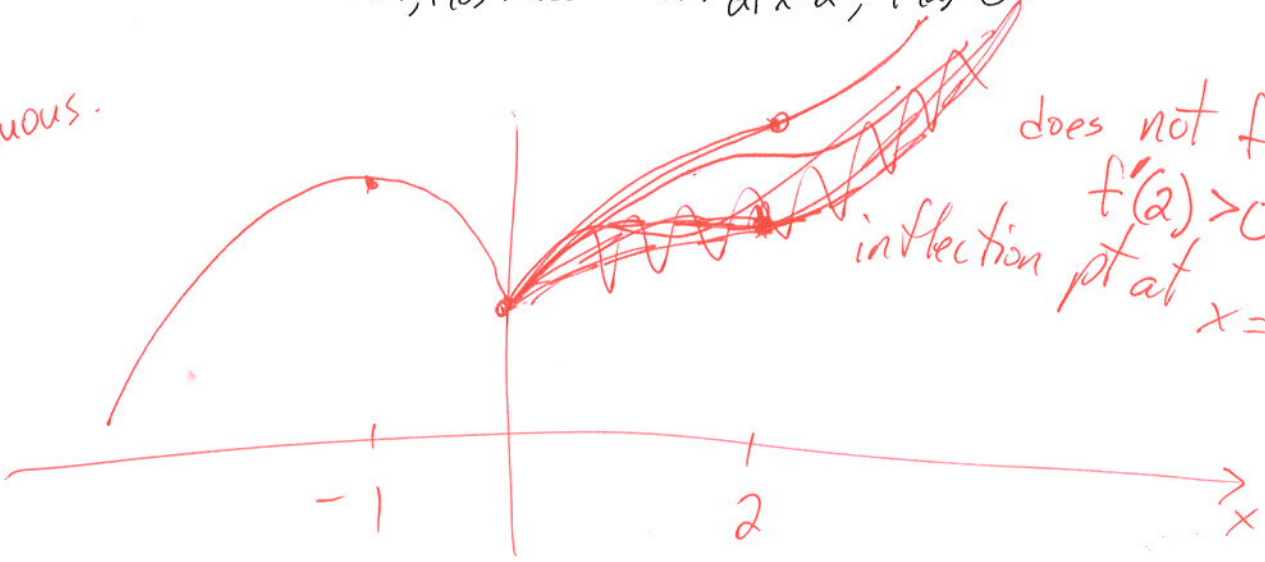
Solutions

1. Draw a graph that satisfies the given derivative chart.

sign of $f'(x)$	+	0	-	x=0	+	2	x
sign of $f''(x)$	-	-	-	-	-	+	+

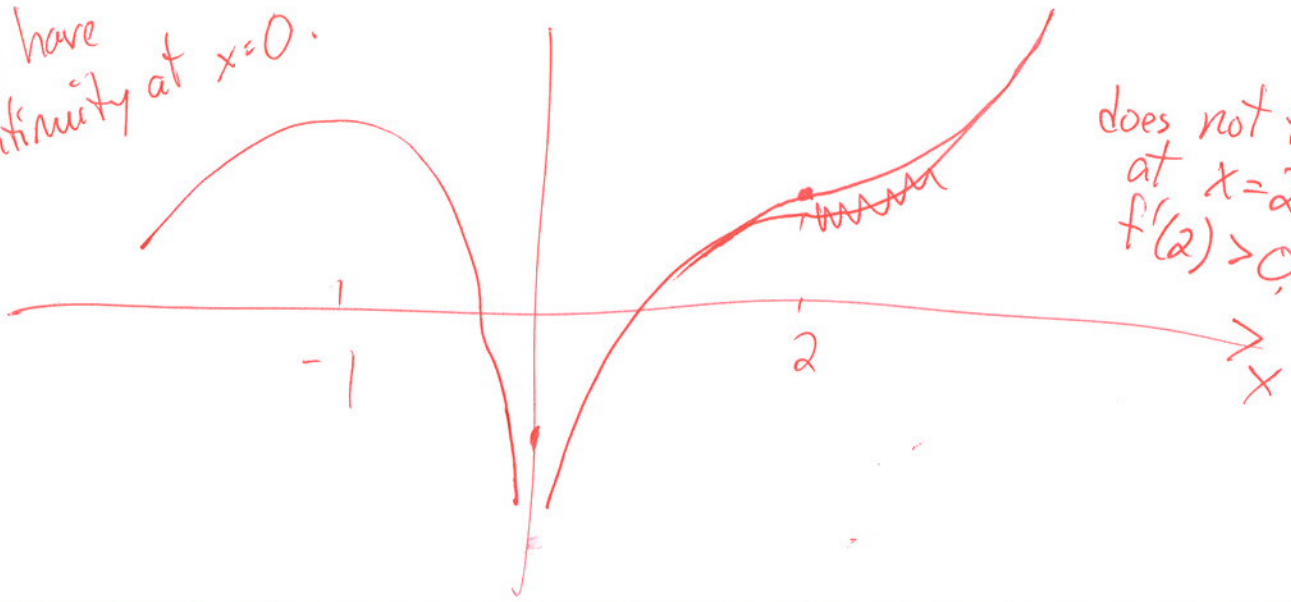
Does not exist  $f'(0), f''(0)$  DNE  $f''(x)$  is zero at  $x=2$ ;  $f''(2)=0$ .

continuous.



does not flatten!  
 $f''(2) > 0$   
 inflection pt at  $x=2$

may have discontinuity at  $x=0$ .



does not flatten  
 at  $x=2$   
 $f''(2) > 0$ .

2. Plot the given function after creating an appropriate derivative chart.

$$f(x) = (x+1)e^{-x}$$

$$\begin{aligned} f'(x) &= 1 \cdot e^{-x} - (x+1)e^{-x} \\ &= (1 - (x+1))e^{-x} \\ &= xe^{-x} \end{aligned}$$

notice  
 $f(-1) = 0$  root.

zero at  $xe^{-x} = 0$   
 only when  $x = 0$ .

$$\begin{aligned} f''(x) &= 1 \cdot e^{-x} - xe^{-x} \\ &= (1-x)e^{-x} \end{aligned}$$

zero at  $(1-x)e^{-x} = 0$   
 only when  $x = 1$

		$x=0$		$x=1$	
$f'(x)$	+	$\phi$	-		
$f''(x)$		-	$\phi$	+	

