



## Quiz 7.2 – Graph Analysis Using First and Second Derivatives

1. (1 pt) [alfredLibrary/AUCI/chapter7/lesson2/quiz-graphanalysis2pet.pg](#)



The graph of the function  $f$  is shown above. Set up number lines and signs for  $f$ ,  $f'$ , and  $f''$ , and interpret them in terms of extrema (l. max, l. min), inflection (infl), increase/decrease/constant (inc, dec, const), and concavity (cu, cd). Choose the answers in the table that match your conclusions.

	$x < -6$	$x = -6$	$-6 < x < -2$	$x = -2$	$-2 < x < 4$	$x = 4$	$x > 4$
$f$	?	?	?	?	?	?	?
$f'$	?	?	?	?	?	?	?
$f''$	?	?	?	?	?	?	?

2. (1 pt) [alfredLibrary/AUCI/chapter7/lesson2/graphanalysis4pet.pg](#)  
Suppose that

$$f(x) = \ln(7x^2 + 5).$$

(a) Compute the first and second derivatives of  $f$ , set up number lines for each, and perform sign tests.

(b) List all critical numbers of  $f$ . If there are no critical values, enter 'NONE'.  
Critical numbers = \_\_\_\_\_

(c) Use interval notation to indicate where  $f$  is increasing.  
Note: Use 'INF' for  $\infty$ , '-INF' for  $-\infty$ , and use 'U' for the union symbol.  
Increasing: \_\_\_\_\_

(d) Use interval notation to indicate where  $f$  is decreasing.  
Decreasing: \_\_\_\_\_

(e) List the  $x$ -coordinates of all local maxima of  $f$ . If there are no local maxima, enter 'NONE'.  
 $x$  values of local maxima = \_\_\_\_\_

(f) List the  $x$ -coordinates of all local minima of  $f$ . If there are no local minima, enter 'NONE'.  
 $x$  values of local minima = \_\_\_\_\_

(g) Use interval notation to indicate where  $f$  is concave up.

Concave up: \_\_\_\_\_

(h) Use interval notation to indicate where  $f$  is concave down.

Concave down: \_\_\_\_\_

(i) List the  $x$  values of all inflection points of  $f$ . If there are no inflection points, enter 'NONE'.  
 $x$  values of inflection points = \_\_\_\_\_

(j) Use all of the preceding information to sketch a graph of  $f$ . When you're finished, enter a "1" in the box below.

Graph Complete: \_\_\_\_\_