1. What does it mean to say that \( a \) is a stationary point for a function \( f \)?

\[ f'(a) = 0 \] (see note 1 below)

2. Fact: if \( f'(x) > 0 \) on an interval \((s,t)\), then on that interval \( f(x) \) is increasing

3. If \( a \) is a stationary point of \( f \), then \( a \) is a local minimum point if \( f' \) changes from negative to positive at \( a \).

(Possible answers might be “CU to CD” or “CD to CU” or “positive to negative” or “decreasing to increasing”, etc).

4. An inflection point occurs at \( p \) if which function changes from increasing to decreasing at \( a \): \( f \), \( f' \), or \( f'' \)?

5. Consider the following graph of the derivative of function \( g(x) \); so you are given the graph of \( g'(x) \) here. Answer the following questions.

(1) On what interval(s) is \( g(x) \) decreasing?

\[ g'(x) < 0 \text{ on } I \text{ then } g(x) \text{ decreases there so : } (2,5) \text{ and } (5,? \text{ (see note 2 below) }}

(2) What are the stationary points of \( g(x) \)?

\[ g'(a) = 0 \text{ at } a = 2 \text{ and } a = 5 \]

(3) On what interval(s) is \( g(x) \) concave down?

\[ g' \text{ is decreasing on } I \text{ then } g \text{ is CP then, so } (1,3) \text{ and } (5,?) \]

(4) Does \( g(x) \) have any local maximum points or minimum points? If so, list their \( x \)-coordinates and classify them (local min or local max).

\[ \text{at } a = 2, \ \text{ } g' \text{ change from POS to NEG, so } g \text{ change from inc to dec } \Rightarrow \text{ there's local max at } a = 2. \]

(5) Find all the inflection points of \( g(x) \).

\[ \text{at each of } a = 3 \text{ and } a = 5, \ g' \text{ changes from } \text{ } \text{CD to CU; in either case the point is an IP.} \]

(6) Make a rough sketch of \( g \) on the bottom graph starting at the dot given. Make sure it increases/decreases and is CD/CU where it should be; but you do not need to worry about the location of the \( x \)-axis.

\[ \text{decr to incr} \]
\[ \text{OR} \]
\[ \text{inc to dec} \text{ so} \]
\[ g \text{ change from CD to CU} \]
\[ \text{OR} \]
\[ \text{CU to CD; in either case the point is an IP.} \]