Name___________________

CALCULUS JOURNAL
CURVE SKETCHING

1. The _______ derivative determines where a graph is increasing & decreasing while the _______ derivative determines where a graph is concave up and down.

2. (a) Critical points are found by ____

   or by ____.

   (b) Points found by the second method of (a) are called ______________________________

   (c) On a graph, critical points are usually located at ______________________________.

   (d) Points where the concavity of a graph changes are called ___________________ points and are found by ____.

3. (a) The term *relative* extrema is used to describe peaks & valleys on a graph because the points ____.

   (b) _________________ extrema are the highest and lowest points of a function.

4. How is the curve sketching process influenced by a function that has vertical asymptotes?

   ____

5. (a) Relative extrema can be located without graphing a function by using the __________________ _______________________ or ____ .

   (b) The first derivative test is nicknamed ______________________________________.

   (c) The __________ derivative test is sometimes inconclusive if _____________________________

   ____

6. (a) On a closed interval, such as $[-4,10]$, absolute extrema are found by:

   1) ____

   2) ____.

   (b) On an open interval, such as $(2,\infty)$, absolute extrema are found by:

   1) ____

   2) ____

   3) ____

7. What conclusion should be made when identifying absolute extrema on the interval $(-6,3)$ with critical points at -1 and 1 if $\lim_{x\to -6^+} f(x) = 2$, $\lim_{x\to 3^-} f(x) = -\infty$, $f'(-1) = -3$, and $f'(1) = 0$?

   ____

8. When looking at the <u>*graph of the derivative*</u> of a function, how do you identify each of the following about the original function?

   Critical points ____

   Increasing & decreasing intervals ____

   Relative extrema ____

   Possible inflection points____

   Concave up & down intervals ____

9. Important Rules, Formulas, Etc.
   (a) Mean Value Theorem formula

   (b) First Derivative Test steps

   (c) Second Derivative Test steps

   (d) Methods for identifying asymptotes

   <u>Vertical</u>

   <u>Horizontal</u>

   <u>Slant (Oblique)</u>

   <u>Curvilinear</u>

   (e) Keystrokes necessary to perform long division in CAS.