Notes about sketching with the derivative

1. If the first derivative is positive, then the original function is ____________________.

2. If the first derivative is negative, then the original function is ____________________.

3. If the first derivative is zero, then there is either a ______________________ ,

    ________________________or _________________________ on the original function.

4. If the second derivative is positive, then the original function is ___________________.

5. If the second derivative is negative, then the original function is __________________.

6. If the second derivative is zero, then there is an ______________ _____________

___________ on the original function. To determine if this point is an _______________

___________ you must check to see if the second derivative changes signs around the point.

If the concavity changes around the point, then it is an _____________ ___________.

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7. If the slopes of the first derivative are positive then the ____________ _____________

is positive. As stated above if the second derivative is positive, then the original is

____________ ___________.

Therefore, if the slopes of the first derivative are positive then the original is

______________ ________.

8. If the slopes of the first derivative are negative then the _____________
    _______________ is negative.

As stated above if the second derivative is negative, then the original is ____________
___________.

Therefore, if the slopes of the first derivative are negative then the original is

______________ ________.

10. If the slopes of the first derivative are zero, then the ___________ ____________ is zero. If the second derivative is zero then the original has a __________ __________ ___________. If the point in question is a relative maximum or a relative minimum on the first derivative, then the slope changes from positive to negative or from negative to positive around that point and the value of the second derivative changes. This change in sign allows the point to be an _______________ _______________. Therefore, the relative maximum and minimum points on the first derivative are ______________ ___________ on the original function.

11. A double root on the first derivative graph means that there is a zero at that point, but does not change signs around the zero point. This means that there is a ______________ on the original graph and also indicates that there will be a _______ ____ ____________ at this point.

12. If a function is continuous, but there is an undefined point on the derivative, then there is either a _____________, ____________, or _____________ on the original graph.

13. If a function is even, then the signs of the first derivative to the left of zero will be _______________of the signs on the right side of zero.

14. If a function is even, then the signs of the first derivative to the left of zero will be _______________of the signs on the right side of zero.

15. If a function is odd, then the signs of the first derivative to the left of zero will be _______________of the signs on the right side of zero.

16. If a function is odd, then the signs of the first derivative to the left of zero will be _______________of the signs on the right side of zero.

17. If there is an undefined point on the first derivative, then there will be a __________ __________ on the second derivative at the same x-value.