Math 4 Honors Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unit 6 Test Review Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Short essay questions based off of your notes & vocabulary
2. Use the average rate of change (slope) formula
3. Use the Power Rule to differentiate of a function
4. Use the derivatives and number line analysis to find the coordinates of the local extrema (max/min), the coordinates of the inflection point(s) and concavity of a function.

Try this function: *f(x)* = *x*3 – 1.5*x*2 – 18*x*

Write the equation of a tangent line to *f* when *x =* -4.

1. Use the position, velocity & acceleration functions to solve vertical motion & particle motion problems.
2. Sketch & label the graph of a function given certain criteria.

 If *f* is a function such that:

 *f* ’(1) = 0

 *f* ’(-3) = 0

 *f*’’(*x*) < 0 for –1 < *x* < 1

 *f*’’(*x*) = 0 when *x* = -1 and *x* = 1

 *f*’’(*x*) > 0 elsewhere,

 graph *f* as best you can.

1. Three Optimization Problems

**Unit 6 Vocabulary**



*Across*

1. The slope of the tangent line for any given value of *x* for a real, continuous function

3. The \_\_\_\_\_\_ derivative of a function helps determine where the function is increasing or decreasing.

5. The second derivative of a function helps determine the function's \_\_\_\_\_.

7. \_\_\_\_\_\_\_ is the second derivative of position.

10. When solving an optimization problem, you use \_\_\_\_\_\_\_ (initials) to justify your solution.

15. When *f* '(*x*) = 0, there is a relative \_\_\_\_\_\_ point.

16. In a particle motion problem, when *f* ’(*x*) < 0, the particle is moving to the \_\_\_\_\_\_\_.

17. The mathematics of change

18. The tangent lines are \_\_\_\_\_\_ at a function’s extrema.

19. \_\_\_\_\_\_\_ (last name) is credited with founding calculus.

*Down*

2. The point where a function’s concavity changes is called the point of \_\_\_\_\_\_\_.

4. In a particle motion problem, when *f* ’(*x*) > 0, the particle is moving to the \_\_\_\_\_\_\_.

6. A line that connects two points of a function.

8. At the point of inflection, the graph \_\_\_\_\_\_ its tangent line.

9. The \_\_\_\_\_\_ lines are above the function when *f* ”< 0.

11. When *f* ' switches from positive to negative, there is a relative \_\_\_\_\_\_\_ for *f*.

12. When *f* ' switches from negative to positive, there is a relative \_\_\_\_\_\_\_ for *f*.

13. Taking higher powers of a function (“climbing up the ladder”)

14. \_\_\_\_\_\_\_ is the first derivative of position.