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| Test 2 Dusty Wilson Math 151No work = no creditNo Symbolic Calculators | **Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*We are usually convinced more easily by reasons we have found ourselves than by those which have occurred to others.*Blaise Pascal (1623 - 1662) French mathematician |

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| Warm-ups (1 pt each): | =\_\_\_\_\_ | =\_\_\_\_\_ | =\_\_\_\_\_ |

(1 pt) According to Pascal (see above), what kind of logic do we find most compelling?

(12 pts) Differentiate . Express your answer as an equation.

(10 pts) Find the equation of the second derivative of .

(10 pts) Find 

(10 pts) An observer stands 300 feet from the launch site of a hot-air balloon. The balloon is launched vertically and maintains a constant upward velocity of 20 ft/s. What is the rate of change of the angle of elevation of the balloon when it is 400 feet from the ground?

(Note: The angle of elevation is the angle between the observer’s line of sight to the balloon and the ground.)

Your answer should be in sentence form, and should include the appropriate units.

(10 pts) Use a linear approximation (or differentials) to estimate the number 

(10 pts) Differentiate . Express  in terms of .

(10 pts) If , find . Give your answer as an equation.

(10 pts) Find the equation of the normal line to  at the point .

(10 pts) Find and evaluate the following given the table below. Circle your answers.

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|  | **1** | **3** | **5** | **7** | **9** |
|  | 3 | 1 | 9 | 7 | 5 |
|  | 7 | 9 | 5 | 1 | 3 |
|  | 9 | 7 | 5 | 3 | 1 |
|  | 5 | 9 | 3 | 1 | 7 |

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