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| Test 3Dusty Wilson Math 151 No work = no credit  No Symbolic Calculators | **Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  *To divide a cube into two other cubes, a fourth power or in general any power whatever into two powers of the same denomination above the second is impossible, and I have assuredly found an admirable proof of this, but the margin is too narrow to contain it.*  Pierre de Fermat (1601 - 1665)  French mathematician |

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

(1 pt) According to Fermat (see above), how long do you think his admirable proof was?

(10 pts) Consider 

1. (8 pts) Find the general antiderivative 
2. (2 pts) If  find the specific antiderivative 

(10 pts) State either the Mean Value Theorem (MVT) or Extreme Value Theorem (EVT). Sketch a picture that explains the theorem.

(10 pts) The base of a rectangle is increasing by 4 cm/s while its height is decreasing by 3 cm/s. At what rate is the area changing when the base is 20 cm and the height is 12 cm?

(10 pts) Evaluate 

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(10 pts) Find and clearly label all local and absolute extremes of  on 

(10 pts) Consider the following function and its derivatives:

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| 1. Find and label intervals where *f* is increasing/decreasing. 2. Find and label all local extremes (label as local min/max or absolute min/max) 3. Find and label intervals where *f* is concave up/down. 4. Find a point of inflection. |