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| Test IIDusty Wilson Math 153 No work = no credit  No Symbolic Calculators | | **Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  *Notable enough, however, are the controversies over the series 1 - 1 + 1 - 1 + 1 - ... whose sum was given by Leibniz as 1/2, although others disagree. ... Understanding of this question is to be sought in the word "sum"; this idea, if thus conceived -- namely, the sum of a series is said to be that quantity to which it is brought closer as more terms of the series are taken -- has relevance only for convergent series, and we should in general give up the idea of sum for divergent series.*  Leonard Euler (1707 - 1783)  Swiss mathematician | |
| Warm-ups (1 pt each): | =\_\_\_\_\_ | =\_\_\_\_\_ | =\_\_\_\_\_ |

(1 pt) According to Euler, what mathematician struggled to understand 1-1+1-1+…? Answer using complete English sentences.

(10 pts) Write  in the form  without finding  for the position vector-valued function  at . That is, you need to find .

(10 pts) Find  for 

(10 pts) Find the kissing circle of  when  given that at this *t* value:

|  |  |
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|  |  |

(10 pts) Find the equation of the tangent line to the curve parameterized by  and  when 

(10 pts) Use techniques developed in this course to verify that the surface area of a sphere with radius 5 is .

Hint: Begin by writing a parametric equation for a circle of radius 5 centered at the origin.

(10 pts) Set up an integral to find the area shared by the circle  and the cardiod .

Note: You may evaluate the integral to verify the area is 

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| Test 2Dusty Wilson Math 153 No work = no credit  No Symbolic Calculators | | **Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  *Notable enough, however, are the controversies over the series 1 - 1 + 1 - 1 + 1 - ... whose sum was given by Leibniz as 1/2, although others disagree. ... Understanding of this question is to be sought in the word "sum"; this idea, if thus conceived -- namely, the sum of a series is said to be that quantity to which it is brought closer as more terms of the series are taken -- has relevance only for convergent series, and we should in general give up the idea of sum for divergent series.*  Leonard Euler (1707 - 1783)  Swiss mathematician | |
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|  |  |
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(10 pts) Find the equation of the tangent line to the curve parameterized by  and  when 

(10 pts) Use techniques developed in this course to verify that the surface area of a sphere with radius 3 is .

Hint: Begin by writing a parametric equation for a circle of radius 3 centered at the origin.

(10 pts) Set up an integral to find the area shared by the circle  and the cardiod .

Note: You may evaluate the integral to verify the area is 