Math 231 Test #2

Your Name:

Please circle your discussion group (1 pt)

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| 1 Yang Yihong A410 | 4 Zhang Junwei A404 | 7 Liu Yuanzhe A424 |
| 2 Xu Yixiao A425 | 5 Liang Jun A408 | 8 Jaden Peterson Wen A421 |
| 3 Dai Ruiqi A426 | 6 She Yuxuan A423 |  |

1. (15 points, 3 points each) Determine whether the statement is true or false. Circle the right answer.

TFTFT

1. Every bounded and monotonic sequence is convergent. (True or False)
2. If and are two divergent series, , then must be divergent. (True or False)
3. If converges for all , then (True or False
4. Every function has power series representation at any point. (True or False)
5. If and , then (True or False)

2. (10 points) (1) If *n*th partial sum of a series is , find and the value of

(2) Find the sum of the series

3. (10 points) Test the convergence of the following series. Please state out the name of the test you used.(a)

By ratio test, , it is convergent.

(b)

, , it is convergent.

(c)

Integral test, diverges

4. (10 points) (1) Test the convergence of the series Please state out the name of the test you used.Hint:

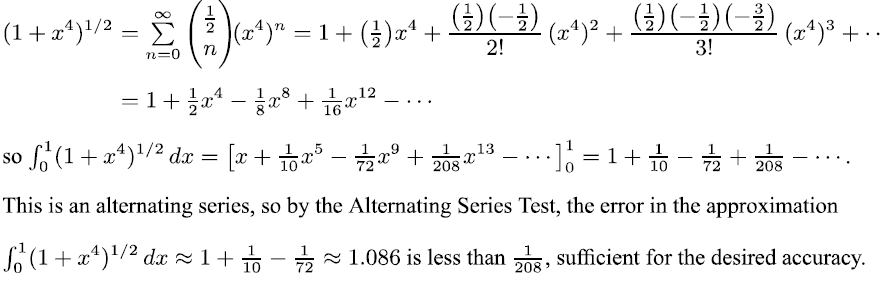
, based on comparison test, it is divergent.

(2) find to make converge

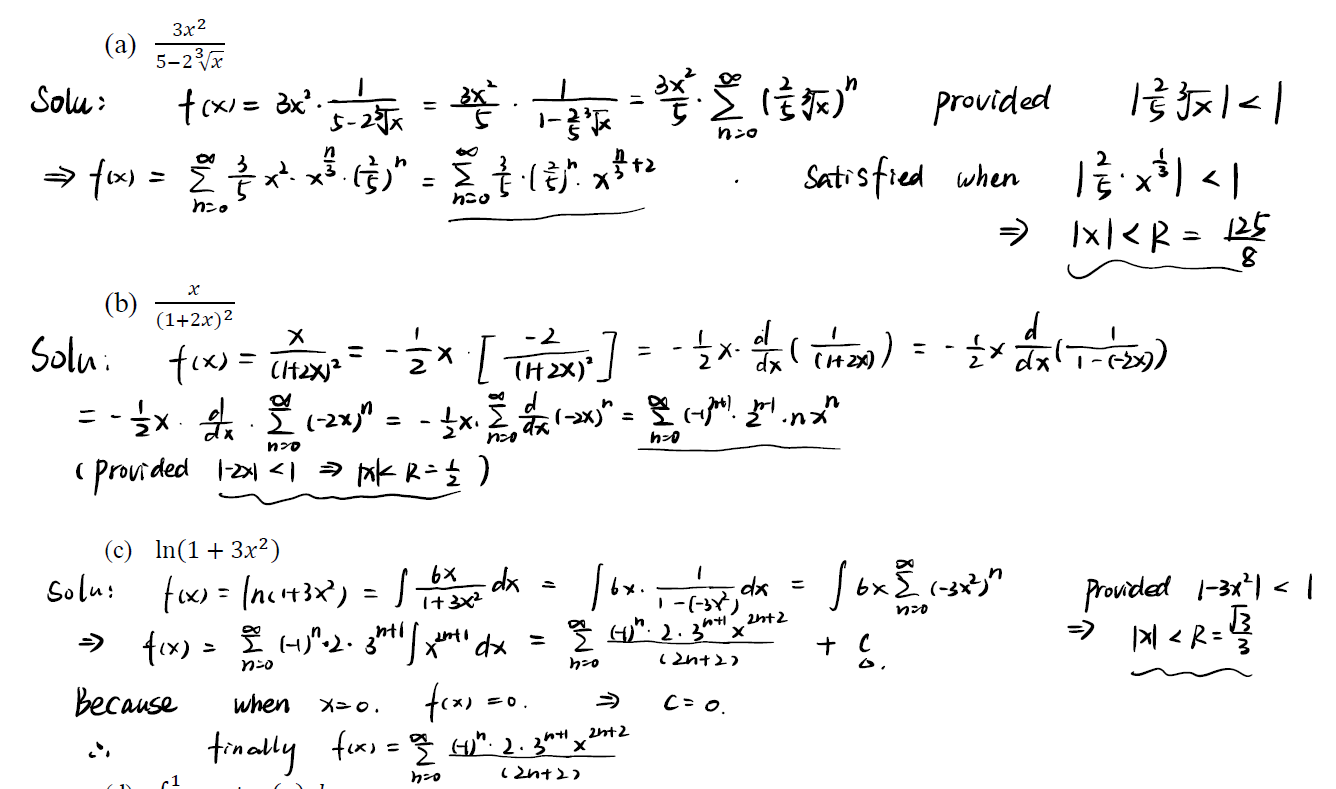
is decreasing and positive so we can use integral test.

So only when the series is convergent.

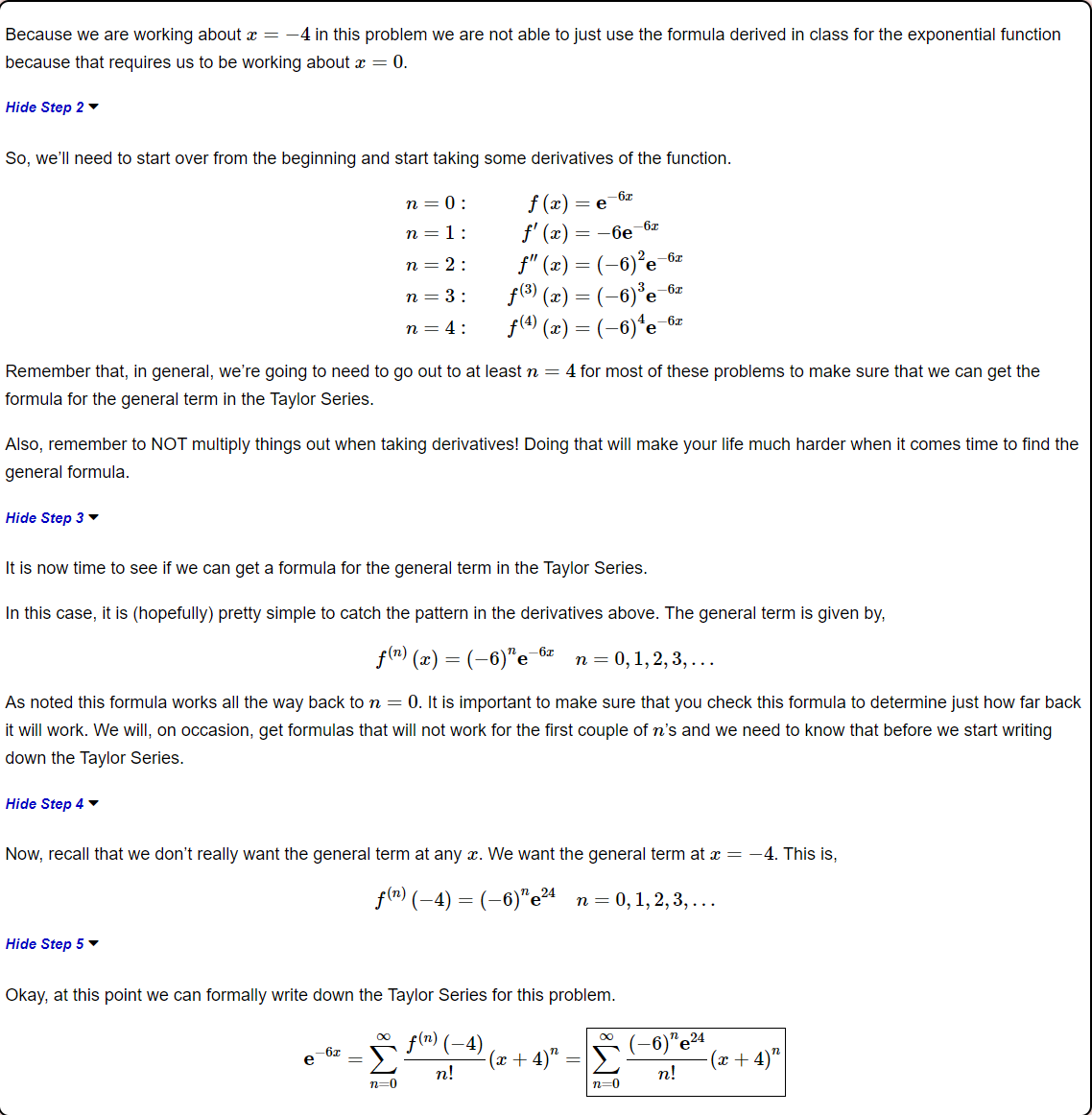
5. (10 points) Use series to approximate , the error with in 0.005.

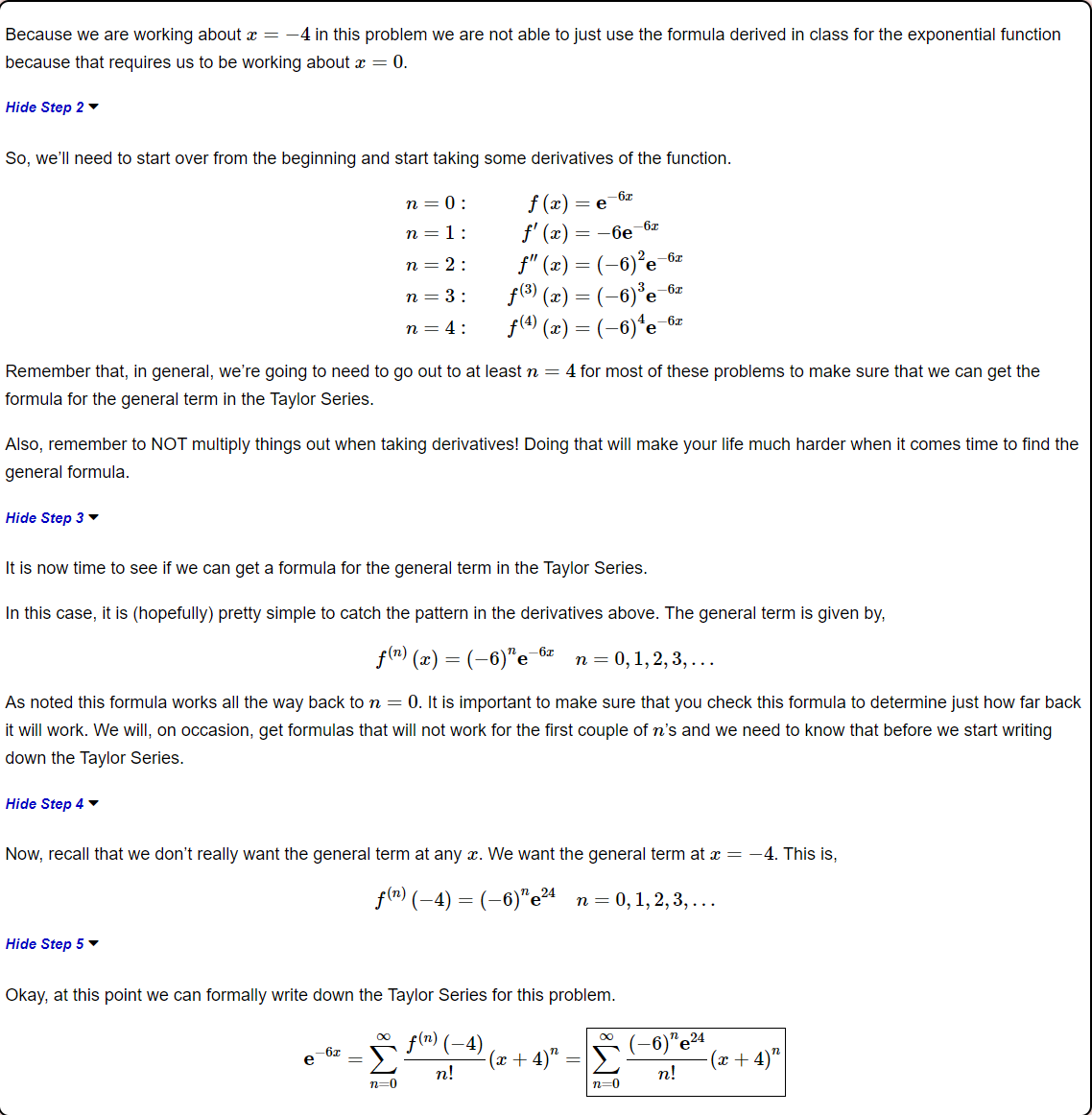


6. (12 points) Find a **power series** representation for each of the following functions. Use summation notation and give the radius of convergence as .



7. (8 points) Find a **power series** representation for about . Use summation notation and give the radius of convergence as ..

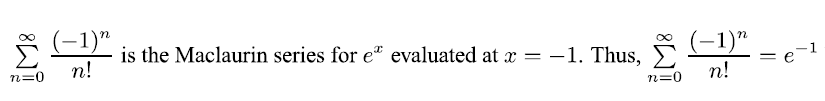




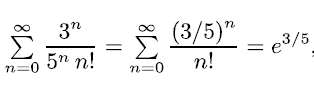
Based on ratio test, converge for all *x*

8. (10 points) Calculate the series sum:

(a)

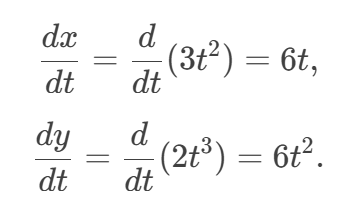


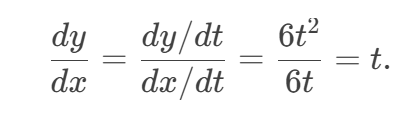
(b)

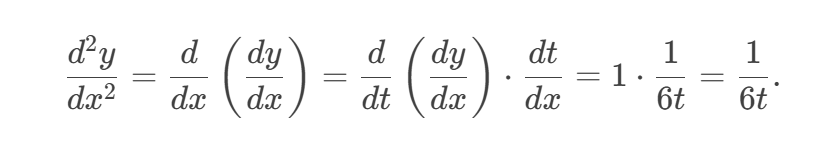


9. (15 points) For the parametric equation

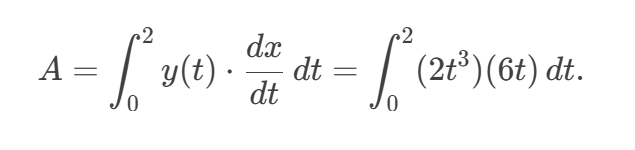
(a) find and .

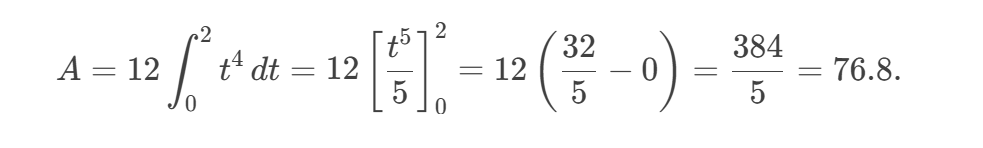






(b) Find the area enclosed by the curve and *x*- for





(b) find the length of the curve, for .

