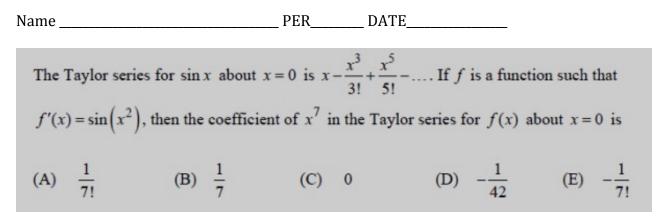
## UNIT 5 - (CALC 25.0) Infinite Series RETEACH



1. What function is defined by a Taylor series in the problem above?

2. What series do you need to answer the question? How do you know?

3. What is the Taylor series for f'(x)? List the first three terms.

4. What can we do to the Taylor series of f'(x) to obtain the Taylor series f(x)?

## **QUICK CHECK!**

10. For 
$$-1 < x < 1$$
 if  $f(x) = \sum_{n=1}^{\infty} \frac{(-1)^{n+1} x^{2n-1}}{2n-1}$ , then  $f'(x) =$   
(A)  $\sum_{n=1}^{\infty} (-1)^{n+1} x^{2n-2}$   
(B)  $\sum_{n=1}^{\infty} (-1)^n x^{2n-2}$   
(C)  $\sum_{n=1}^{\infty} (-1)^{2n} x^{2n}$   
(D)  $\sum_{n=1}^{\infty} (-1)^n x^{2n}$   
(E)  $\sum_{n=1}^{\infty} (-1)^{n+1} x^{2n}$ 

What is the coefficient of  $x^{6}$  in the Taylor series for  $\frac{e^{3x^{2}}}{2}$  about x = 0? (A)  $\frac{1}{1440}$  (B)  $\frac{81}{160}$  (C)  $\frac{9}{4}$  (D)  $\frac{9}{2}$  (E)  $\frac{27}{2}$ 

## Tajima HS

## FRQ!

6. The function g is continuous for all real numbers x and is defined by

$$g(x) = \frac{\cos(2x) - 1}{x^2} \text{ for } x \neq 0$$

- (a) Use L'Hospital's Rule to find the value of g(0). Show the work that leads to your answer.
- (b) Let f be the function given by f(x) = cos(2x). Write the first four nonzero terms and the general term of the Taylor series for f about x = 0.
- (c) Use your answer from part (b) to write the first three nonzero terms and the general term of the Taylor series for g about x = 0.
- (d) Determine whether g has a relative minimum, a relative maximum, or neither at x = 0. Justify your answer.