

Name _____

MATH 102 - Quiz 5b

I.D. # _____

- (1) Find the interval and radius of convergence for the series $\sum_{k=1}^{\infty} (-1)^k \frac{x^k}{k}$

See Version 5a

- (2) Write the first nonzero 4 terms of the Maclaurin series for $\frac{e^x}{1+x}$

$$e^x = 1 + x + \frac{x^2}{2} + \frac{x^3}{3!} + \frac{x^4}{4!} + \dots$$

$$\frac{1}{1+x} = 1 - x + x^2 - x^3 + x^4 - x^5 + \dots$$

$$\frac{e^x}{1+x} = e^x \cdot \frac{1}{1+x} = \left(1 + x + \frac{x^2}{2} + \frac{x^3}{3!} + \frac{x^4}{4!} + \dots\right) \left(1 - x + x^2 - x^3 + x^4 - x^5 + \dots\right)$$

$$= \dots$$

$$= 1 + \frac{x^2}{2} - \frac{1}{4}x^3 + \frac{5}{12}x^4$$

- (3) Find the Maclaurin series of $\sin 2x$

See Version 5a