6. Given the series $\sum_{n=0}^{\infty} \frac{x^n}{n!}$ answer the following questions.

a. List the first 6 terms of the series and the general term

$$\sum_{n=0}^{\infty} \frac{x^n}{n!} =$$

b. Enter the first 6 terms into y_1 of your calculator. Use X[-π,π] and Y[-1,1] as your window.

c. What function does it look like the series represents? That function is the sum of this series.

d. What would happen to the graphs if the first 10 terms of the series are entered into y_1.

e. Substitute x^2 for x in the series you found in part a then simplify.

7. Given the series $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{x^n}{n}$ answer the following questions.

a. List the first 6 terms of the series and the general term

$$\sum_{n=1}^{\infty} (-1)^{n-1} \frac{x^n}{n} =$$

b. Enter the first 6 terms into y_1 of your calculator. Use X[-π,π] and Y[-1,1] as your window.

c. What function does it look like the series represents? That function is the sum of this series.

d. What would happen to the graphs if the first 10 terms of the series are entered into y_1.

e. Substitute x^3 for x in the series you found in part a then simplify.

8. Given the series $\sum_{n=0}^{\infty}(-1)^n \frac{x^{2n+1}}{2n+1}$ answer the following questions.

a. List the first 6 terms of the series and the general term

$$\sum_{n=0}^{\infty}(-1)^n \frac{x^{2n+1}}{2n+1} = \frac{x}{1} - \frac{x^3}{3} + \frac{x^5}{5} - \frac{x^7}{7} + \frac{x^9}{9} - \frac{x^{11}}{11} + \cdots - \frac{(-1)^n x^{2n+1}}{2n+1}$$

b. Enter the first 6 terms into y_1 of your calculator. Use X[-π,π] and Y[-1,1] as your window.

c. What function does it look like the series represents? That function is the sum of this series.

$\tan^{-1}x = \arctan x$

d. What would happen to the graphs if the first 10 terms of the series are entered into y_1.

Looks more and more like $\arctan x$

e. Substitute x^3 for x in the series you found in part a then simplify.

$$\sum_{n=0}^{\infty}\frac{(-1)^n (x^3)^{2n+1}}{2n+1} = \sum\frac{(-1)^n x^{6n+3}}{2n+1} = x^3 - \frac{x^9}{3} + \frac{x^{15}}{5} - \frac{x^{21}}{7} + \frac{x^{27}}{9} - \frac{x^{33}}{11}$$