Given: $f(x) = \cos(x)$				
a. Determine a line $P(x)$ that closely matches the characteristics of $f(x)$ at the point $(0,1)$ .	c. Fill in the when nec		able (rounding	to 3 decimal places
	20	f(x)	D(x)	f(x) - D(x)

b.	Use Geogebra to visualize	how f(x)	and $P(x)$
int	eract		

 $P(x) = \underline{\hspace{1cm}}$ 

х	f(x)	P(x)	f(x)-P(x)
0			
.1			
.5			
1			

٥.	c( )		
Given:	f(x)	$= \cos($	x

a.	Determine a <b>parabola</b> $P(x)$ that closely matches the
ch	aracteristics of $f(x)$ at the point $(0,1)$ .

$$P(x) = \underline{\hspace{1cm}}$$

b.	Use Geogebra to visualize	how	f(x)	and	P(x)
int	eract.				

c. Fill in the following table	(rounding to 3 decimal	places
when necessary).		

1			1
X	f(x)	P(x)	f(x)-P(x)
0			
.1			
.5			
1			

۰.	_	`	v
Given:	a(x)	=	e^

a. Determine a line $P(x)$ that closely matches th	e			
characteristics of $f(x)$ at the point $(0, 1)$ .				

$$P(x) = \underline{\hspace{1cm}}$$

b. Use Geogebra to visualize how f(x) and P(x) interact.

c.	Fill in the following table (rounding to 3 decimal places
w	nen necessary).

х	g(x)	P(x)	g(x)-P(x)
0			
.1			
. 5			
1			

<u>~·</u>		()		. Y
Given:	g	(x)	=	e"

a. D	etermine a parabola $P(x)$ that closely matches the
char	acteristics of $f(x)$ at the point $(0,1)$ .

$$P(x) = \underline{\hspace{1cm}}$$

b. Use Geogebra to visualize how f(x) and P(x) interact.

c. Fill in the following table (rounding to 3 decimal places when necessary).

x	g(x)	P(x)	g(x)-P(x)
0			
.1			
. 5			
1			

	c ( )		/ \
Given:	# 1 V 1	- 000	ועוי
OIVEII.	1 ( A 1	— cos	いんり
	,		. ( )

Determine a **fourth degree polynomial**, P(x), that closely matches the characteristics of f(x) when centered at x=0.

х	f(x)	P(x)	f(x)-P(x)
0			
.1			
.5			
1			

Given:  $g(x) = e^x$ 

Determine a **fourth degree polynomial**, P(x), that closely matches the characteristics of f(x) when centered at x=0.

$\boldsymbol{x}$	g(x)	P(x)	g(x)-P(x)
0			
.1			
.5			
1			

، اسم،
work.

$$6. \ f(x) = tan^{-1}x$$

Investigating the Taylor/MacLaurin Series for  $f(x) = tan^{-1}x$  centered at x = 0.

intestigating the raylor/massaarin series for j (ii)	n centered den
$f(x) = \frac{1}{1-x} = \sum_{n=0}^{\infty}$	$g(x) = tan^{-1}x = \sum_{n=0}^{\infty}$
f'(x) =	$g'(x) = \frac{1}{1+x^2} = \frac{1}{1-(1-x^2)} = \sum_{n=0}^{\infty}$

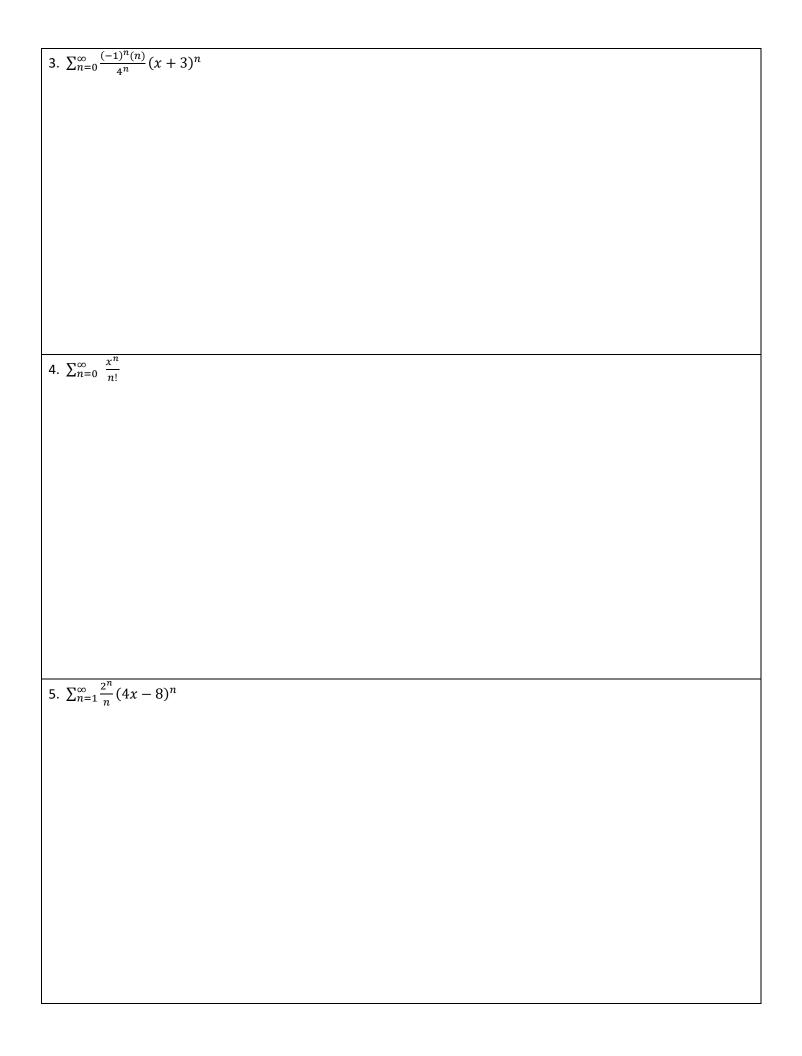
## Power Series and Radius of Convergence

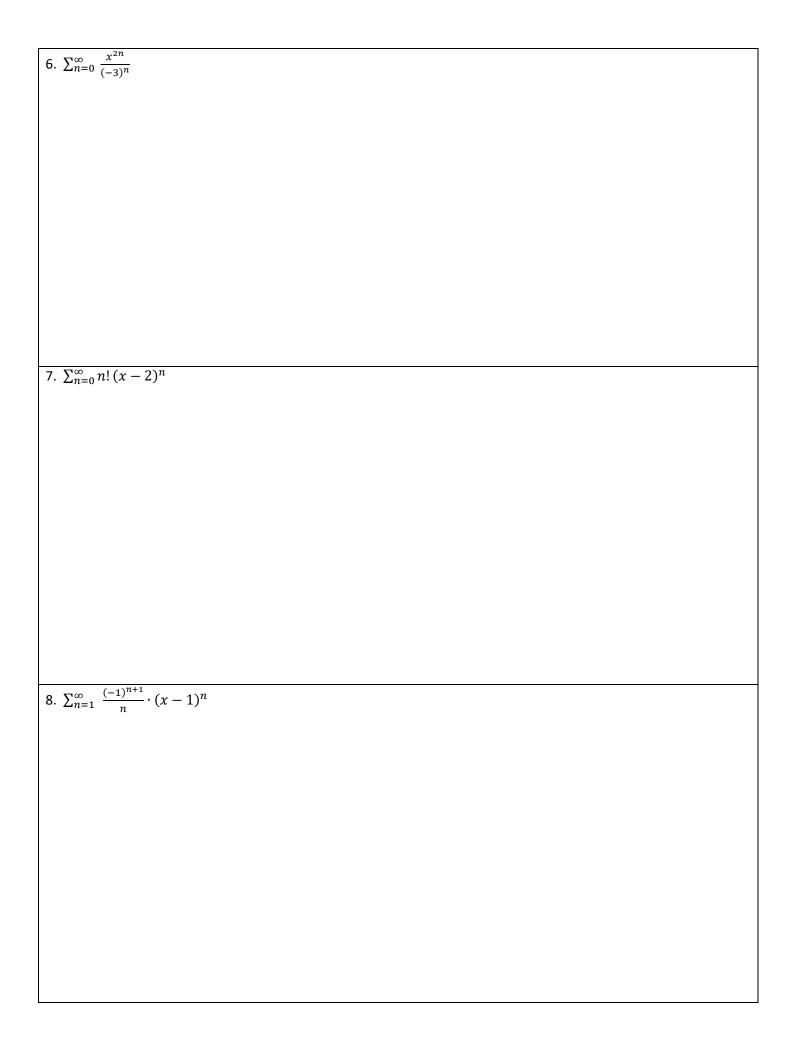
A Power Series centered at x = a is a function of x and can be written as:

$$f(x) = C_0 + C_1(x - a)^1 + C_2(x - a)^2 + C_3(x - a)^3 + \dots = \sum_{n=0}^{\infty} C_n(x - a)^n$$

- \* For each Power Series, a. Write out the first 4 terms of the series, then b. Use the Ratio Test to determine both the Interval of Convergence and Radius of Convergence.
- 1.  $\sum_{n=0}^{\infty} \left(\frac{x}{2}\right)^n$

2.  $\sum_{n=1}^{\infty} \frac{n^3(x+5)^n}{6^n}$ 





9. $\sum_{n=1}^{\infty} \frac{(x-6)^n}{n^n}$	
$ \Delta n=1 \qquad n^n $	
10. $\sum_{n=0}^{\infty} 2^{2n} \cdot x^{2n}$	
10. Zn=0 2 x	