AP Calculus BC Unit 10 – Sequences & Series (Part 2)

## **Day 5 Notes: Geometric Power Series**

We can write a power series for some functions in the form of a geometric series

 $\sum_{n=0}^{\infty} a r^n = \frac{a}{1-r}, \text{ where } |r| < 1. \text{ We may have to manipulate } f(x) \text{ to put it in the form } \frac{a}{1-r}.$ 

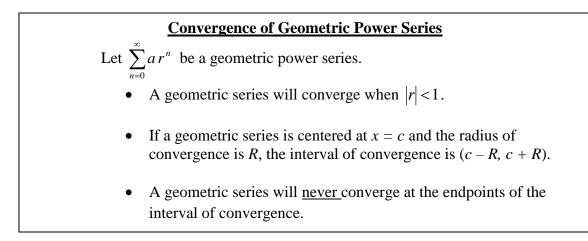
## **Examples:**

1. Write a geometric power series centered at c = 0 for  $f(x) = \frac{3}{2x-1}$ .

2. Find a geometric power series centered at c = -2 for  $f(x) = \frac{3}{4-x}$ .

## \*\*Take care of the center first!

3. Write a geometric power series centered at c = 0 for  $f(x) = \frac{4x-7}{2x^2+3x-2}$ .



## **Examples:**

4. Find a power series for  $f(x) = \frac{4}{3x+2}$  centered at c = 2. Then find the interval of convergence.

5. Write a geometric power series centered at c = 0 for  $f(x) = \frac{3x-1}{x^2-1}$ . Then find the interval of convergence.

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Find a power series for the function, centered at c, and determine the interval of convergence.

1) $f(x) = \frac{4}{5-x}, c = -2$	2) $f(x) = \frac{3}{2x-1}, c = 2$
3) $f(x) = \frac{1}{2x-5}, c = 0$	4) $f(x) = \frac{4}{3x+2}, c = 2$

5) 
$$f(x) = \frac{3x}{x^2 + x - 2}, c = 0$$
  
6)  $f(x) = \frac{2}{1 - x^2}, c = 0$