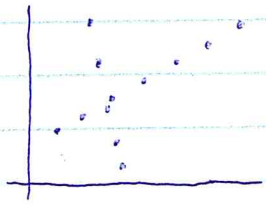
Converging and Diverging Series

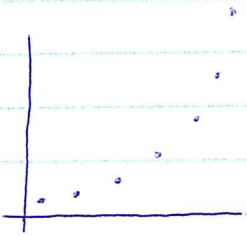
Arithmetic



Gets really big or
Gets really small

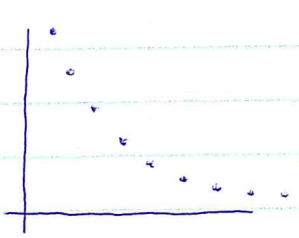
Geometric

$|r| > 1$



Exponential Growth

$|r| < 1$



Exponential Decay

DIVERGENT

CONVERGENT

- If a series is convergent we can find an **Infinite Sum**.
- (We've already found finite sums.)

Example #1 $10 + 5 + 5/2 + 5/4 + \dots$

Geometric $r = 1/2$

$|1/2| < 1$ thus converges

$S_\infty = \frac{a_1}{1-r}$ $\quad S_\infty = \frac{10}{1-1/2} \longrightarrow S_\infty = 20$

Example #2 $2 + 4 + 6 + 8 + \dots$

Arithmetic so Diverges

Example #3 $3 + 3.6 + 4.32 + 5.184$

Geometric $r = 1.2$

$|r| > 1$ so Diverges

Assignment: pg 904 #2-7, 15-20, 30-37