

## AZ warm up 3/24

1. find  $S_8$  given the sequence

a)  $17 + 21 + \overset{25}{\cancel{24}} \dots$

b)  $15 + 4.5 + 1.35 \dots$

2. find the missing piece

a)  $5 + 15 + 45 \dots + \cancel{135} u_8$

$S_8 = \underline{\hspace{2cm}}$

b)  $18 + 22 + 26 + \dots + 82$

~~$S_8$~~   $S_n = \underline{\hspace{2cm}}$

## Infinite Sum Equation

AZ

\* if  $|r| < 1$  (a fraction)  $\hat{=}$   $S_{\infty}$  (infinite sum) then the formula is

$$S_{\infty} = \frac{u_1}{1-r}$$

$n = \infty$   $\leftarrow$  1<sup>st</sup> term  
 $\leftarrow$  rule/ratio

\* only works for geometric sequences

\* only works when  $r$  is less than 1

### examples

1.  $100 + 50 + 25$

$u_1 = 100, r = 1/2$  continues on

$$S_{\infty} = \frac{100}{1-1/2} = \frac{100}{1/2} = \boxed{200}$$

2.  $\sum_{n=1}^{\infty} 3(1/3)^{n-1}$   $\leftarrow n = \infty$

$u_1 = 3, r = 1/3$

$$S_{\infty} = \frac{3}{1-1/3} = \boxed{4.5}$$

3.  $8 + 16 + 32 \dots$

$u_1 = 8, r = 2 \ddot{:}$

none!

4.  $\sum_{n=1}^{10} 2(1/2)^{n-1}$   $\leftarrow n = 10$  not  $\infty$

$$S_{10} = \frac{2(1-(1/2)^{10})}{1-1/2} = 3.996$$