1.5 Infinite Geometric Series

$t_1 = \frac{1}{2} \quad t_2 = \frac{1}{4} \quad t_3 = \frac{1}{8}$

$\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \ldots = 1$

$S_n = \frac{t_1(r^n - 1)}{r - 1}$

$S_\infty = \frac{t_1(r^n - 1)}{r - 1}$ → $r^n \to 0$

$S_\infty = \frac{\frac{1}{2}\left(\left(\frac{1}{2}\right)^\infty - 1\right)}{\frac{1}{2} - 1}$ → $\left(\frac{1}{2}\right)^\infty \to 0$

$= \frac{\frac{1}{2}(-1)}{-\frac{1}{2}} = +1$

$S_\infty = \frac{\frac{1}{2}}{1 - \frac{1}{2}} = 1$

$r < 1$

$*\ -1 < r < 1$

$|r| < 1$

$S_\infty = \frac{t_1(1 - 0)}{1 - r}$

$$S_\infty = \frac{t_1}{1 - r}$$

Try this: $8 + 2 + 0.5 + \ldots \quad t_1 = 8 \quad r = \frac{1}{4}$

$S_\infty = \frac{8}{1 - \frac{1}{4}} = 8 \div \frac{3}{4} = 8 \times \frac{4}{3} = \frac{32}{3} = 10.\overline{6}$

Sum these: $200 + 20 + 2 + 0.2 + \ldots$

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#1-5 (at least 1)
#6-18, #22