7.6 Geometric Series

Again, two formulas:

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

$$S_n = \frac{ar^n - a}{r - 1}$$ (t_{n+1} over ar^n, t_1 over a)

$$S_n = \frac{t_{n+1} - t_1}{r - 1}$$

$$t_n = ar^{n-1}$$

$$t_{n+1} = ar^n$$

You do not need (n)

Two examples:

Find S_{12} of $12, 24, 48 \ldots$

$r = 2 \quad a = 12 \quad n = 12$

$$S_{12} = \frac{a(r^n - 1)}{r - 1}$$

$$S_{12} = \frac{12(2^{12} - 1)}{2 - 1} = 49140$$

Calculate the sum of the geometric series

$3 - 15 + 75 \ldots - 234375, \; 1171875$

$r = -5$

t_n $\quad$ t_{n+1}

$\times -5$

$$S_n = \frac{t_{n+1} - t_1}{r - 1} = \frac{1171875 - 3}{-5 - 1} = -195312$$

-6