

PreCalculus
Review Series

Name _____

1. Find S_{25} of $7 + 13 + 19 + 25 \dots$
2. Find S_{10} of $256 - 64 + 16 - 4 \dots$
3. Find the sum of the first 30 terms of the arithmetic series with $a_1 = 20$ and $d = -4$.
4. Find the sum of the first n terms of the geometric series with $a_1 = 10000$, $a_n = .01$ and $r = -.1$.

Determine the number of terms in the following arithmetic series given:

5. $t_1 = 11$, $t_n = 129$ and $S_n = 4200$

6. $t_1 = -6$, $d = 11$ and $S_n = 3699$

Determine the number of terms in the following geometric series given:

7. $t_1 = 5$, $r = 4$ and $S_n = 436905$

8. $1 - 3 + 9 - 27 \dots$, and $S_n = -14762$

① Arithmetic

$$S_{25} = \frac{25(7 + t_{25})}{2}$$

$$t_{25} = 7 + (25-1)(6) \\ = 151$$

$$S_{25} = \frac{25(7+151)}{2} = 1975$$

② geometric

$$S_{10} = \frac{256 \left(1 - \left(-\frac{1}{4}\right)^{10}\right)}{1 - -\frac{1}{4}}$$

$$= \frac{209715}{1024} = 204.8$$

③

$$S_{30} = \frac{30(20 + t_{30})}{2}$$

$$t_{30} = 20 + (30-1)(-4) \\ = -96$$

$$\frac{30(20 + -96)}{2} = -1140$$

④

$$\text{need } n, a_n = .01 \rightarrow .01 = 10000(-.1)^{n-1}$$

$$.000001 = (-.1)^{n-1}$$

$$n-1 = 6$$

$$n = 7$$

$$S_7 = \frac{10000(1 - (-.1)^7)}{1 - -.1} = 90909.1$$

$$\textcircled{5} \quad 4200 = \frac{n(11+129)}{2}$$

$$8400 = n(140)$$

$$\textcircled{60 = n}$$

$$\textcircled{6} \quad 3699 = \frac{n(-6 + t_n)}{2} \rightarrow t_n = -6 + (n-1)(11) \\ = 11n - 17$$

$$3699 = \frac{n(-6 + 11n - 17)}{2}$$

$$7398 = n(11n - 23)$$

$$0 = 11n^2 - 23n - 7398$$

$$\frac{23 \pm \sqrt{(23)^2 - 4(11)(-7398)}}{2(11)}$$

$$\frac{23 \pm 571}{22} = 27 \text{ or } \cancel{-274}$$

$$\textcircled{n=27}$$

$$\textcircled{7} \quad 436905 = \frac{5(1-4^n)}{1-4}$$

$$-1310715 = 5(1-4^n)$$

$$-262143 = 1-4^n$$

$$-262144 = -4^n$$

$$\textcircled{n=9}$$

$$\textcircled{8} \quad -14762 = \frac{1(1-(-3)^n)}{1-(-3)}$$

$$-59048 = 1-(-3)^n$$

$$-59049 = -(-3)^n$$

$$59049 = (-3)^n$$

$$\textcircled{n=10}$$