Find the n^{th} term of each arithmetic sequence:

$a_1 = 7, \quad d = 3, \quad n = 14$

$$a_n = a_1 + (n-1)d$$
$$= 7 + (14-1)(3)$$
$$= 7 + (13)(3)$$
$$= 7 + 39$$

$$\boxed{a_n = 46}$$

Find the n^{th} term of each arithmetic sequence:

$a_1 = 20, \quad d = 4, \quad n = 100$

$$a_n = a_1 + (n-1)d$$
$$= 20 + (100-1)(4)$$
$$= 20 + (99)(4)$$
$$= 20 + 396$$

$$\boxed{a_n = 416}$$

$$\begin{array}{r} {\scriptstyle 3} \\ 99 \\ \times\ 4 \\ \hline 396 \end{array}$$

Find the $\boxed{12}^{th}$ term for the sequence:

$n=12$

$-17, -13, -9, \ldots$ $\quad d = -13 - -17$

$a_1 = -17$ $\quad = -13 + 17 = 4$

$$a_n = a_1 + (n-1)d$$
$$= -17 + (12-1)(4)$$
$$= -17 + (11)(4)$$
$$= -17 + 44$$

$\boxed{a_n = 27}$

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124 is the $\frac{19}{n=?}$ th term in the sequence

a_n

$-2, 5, 12, \ldots .$ $\quad d = 5 - -2 = 7$

a_1

$$a_n = a_1 + (n-1)d$$
$$124 = -2 + (n-1)(7)$$
$$124 = -2 + 7n - 7$$
$$124 = -9 + 7n$$
$$+9 \quad +9$$
$$\frac{133}{7} = \frac{7n}{7}$$

$\boxed{n = 19}$

Find the missing terms of the sequence:

55, 70, 85, 100, 115 $\quad n = 5$

a_1 = 55, +15, $d = ?$, a_n = 115

$a_n = a_1 + (n-1)d$

$115 = 55 + (5-1)d$

$115 = 55 + 4d$

$-55 \quad -55$

$\frac{60}{4} = \frac{4d}{4}$

$d = 15$

Find the sum, S_n, for each arithmetic series described:

$a_1 = 4, \quad a_n = -16, \quad n = 5$

$S_n = \frac{n}{2}(a_1 + a_n)$

$= \frac{5}{2}(4 + -16)$

$= \frac{5}{2}(-12)^{-6} = 5(-6)$

$S_n = -30$

Find the sum, S_n, for each arithmetic series described:

$a_1 = 3, \quad a_n = 33, \quad n = 6$

$$S_n = \frac{n}{2}(a_1 + a_n)$$

$$= \frac{6}{2}(3 + 33)$$

$$= 3(36)$$

$$\boxed{S_n = 108}$$

Find the sum of the series:

$$-4 + (-1) + 2 + 5 + \ldots + 53$$

a_1 $\quad d = -1 - -4$ $\quad d = 3$ $\quad n = ?$ $\quad a_n$

$$a_n = a_1 + (n-1)d$$

$$53 = -4 + (n-1)(3)$$

$$53 = -4 + 3n - 3$$

$$53 = -7 + 3n$$

$$+7 \quad +7$$

$$\frac{60}{3} = \frac{3n}{3}$$

$$\boxed{n = 20}$$

$$S_n = \frac{n}{2}(a_1 + a_n)$$

$$= \frac{20}{2}(-4 + 53)$$

$$= 10(49)$$

$$\boxed{S_n = 490}$$

Find the sum of the series:

$$\sum_{k=0}^{5} (5k - 7)$$

a_n → upper limit 5

a_1 ← lower limit 0

0, 1, 2, 3, 4, 5

$n = 6$

$a_n = 5(5) - 7$

$= 25 - 7$

$a_n = 18$

$a_1 = 5(0) - 7$

$= 0 - 7$

$a_1 = -7$

$$S_n = \frac{n}{2}(a_1 + a_n)$$

$$= \frac{6}{2}(-7 + 18)$$

$$= 3(11)$$

$$\boxed{S_n = 33}$$