HW 2

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HW2

1) $S = 5 + 9 + 13 + \dots 89$

$a_1 = 5$; $d = 4$; $a_n = a_1 + (n-1)d$

$89 = 5 + (n-1)d$

$-5 \quad -5$

$84 = (n-1) \cdot 4$

$:4 \quad :4$

$21 = (n-1)$

$+1 \quad +1$

$22 = n$

$n = 22$

2) $\sum_{k=3}^{15} (2k+1)$ to start at $k=1$

$k = 3$; $j = k - 2$; $k = j + 2$

$$\sum_{k=3}^{15} (2k+1) = \sum_{j=1}^{13} (2(j+2)+1) = \sum_{j=1}^{13} (2j+5)$$

3) $a_1 = 12$; $a_{10} = 57$, find the value of d and find a_{25}.

Find d: $\frac{a_y - a_x}{y - x} = \frac{57 - 12}{9} = 5$

Find $a_{25} = \cancel{a_n + (n-1)d}$ $a_1 + (25-1) \cdot d$

3) $a\ \cancel{25} = 12 + (25-1) \cdot d$

$a_{25} = 12 + (24 \cdot 5)$

$a_{25} = 132$

$d = 5$; $a_{25} = 132$

4) find the sum of all multipeles of 7 beetween 100 and 1000.

$a_1 = 100 : 7 = 14.28 = 15 = 15 \cdot 7 = 105$

$a_n = 1000 : 7 = 142.85 = 142 \cdot 7 = 994$

$n = \frac{a_n - a_1}{d} + 1 = \frac{994 - 105}{7} + 1 = 128$

$S = \frac{a_1 + a_n}{2} \cdot n = \frac{105 + 994}{2} \cdot 128 = 70{,}336$

5) $S = \sum_{k=1}^{n} (3k+2)$ find the value of n such that $S = 2650$.

$(3 \cdot 1 + 2) + (3 \cdot 2 + 2) \dots$

$a_1 = 5$; $d = 3$

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

$2650 = 5 + (n-1)d$

$-5 \quad -5$

$2645 = (n-1) \cdot 3$

$:3 \quad :3$

$= 881{,}6 = n - 1$

$n = 882{,}6$