

## Sum of Arithmetic Sequence.

$$S_n = \sum_{k=1}^n a_k = \frac{n}{2} (\text{1st} + \text{last})$$

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

$$\begin{array}{ccccccc} & +d & & +d & & +d & & +d \\ \text{---} & & \text{---} & & \text{---} & & \text{---} & & \text{---} \\ & & & & & & & & a_5 \end{array}$$

$$a_5 = a_1 + 4d$$

$$a_{10} = a_1 + 9d.$$

$$a_{10} = a_4 + \overset{7}{\underline{\underline{(10-4)}}} d.$$

$$\begin{array}{cccccccccccc} \text{---} & \text{---} & \text{---} & \text{---} & \wedge & \text{---} & \wedge & \text{---} & \wedge & \text{---} & \wedge & \text{---} & \wedge & \text{---} & \wedge & \text{---} \\ & & & & & a_4 & & & & & & & & & & a_{10} \end{array}$$

$$a_4 + 6d = a_{10}$$

Book  $a_{10} = a_4 + 6d$

Arithmetic

$$\text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \frac{7}{a_4} \quad \frac{9}{a_5} \quad \dots = \frac{31}{a_{10}}$$

$$d = 2 \quad 9 - 7 = 2$$

$$d = \text{Right} - \text{left}$$

$$\begin{aligned} a_{12} &= a_5 + 7d \\ \Downarrow & \\ 23 &= 9 + 7(2) \\ 12 - 5 &= 7 \end{aligned}$$

Arithmetic

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

$$a_n = a_k + (n-k)d$$

$$d = \text{right} - \text{left}$$

$$S_n = \left( \frac{\text{1st} + \text{last}}{2} \right) n$$

$$\frac{n}{2} (\text{1st} + \text{last})$$

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

12.3

21-35 ; 38-42