

1.  $S_5 + S_7 = 167$

$$\frac{5}{2} [2a + 4d] + \frac{7}{2} [2a + 6d] = 167$$

$$\Rightarrow \frac{5 \times 2}{2} (a + 2d) + \frac{7 \times 2}{2} (a + 3d) = 167$$

$$\Rightarrow 5a + 10d + 7a + 21d = 167$$

$$\Rightarrow 12a + 31d = 167 \dots \textcircled{i}$$

$$S_{10} = 235$$

$$\frac{5 \times 10}{2} [2a + 9d] = 235$$

$$\Rightarrow 2a + 9d = \frac{235}{5} \dots \textcircled{ii}$$

$$\textcircled{i} \times 1 - \textcircled{ii} \times 6$$

$$12a + 31d = 167$$

$$12a + 54d = 282$$

$$\hline -23d = -115$$

$$\Rightarrow d = 5$$

Sub in  $\textcircled{ii}$

$$2a + 45 = 47$$

$$\Rightarrow 2a = 47 - 45$$

$$\Rightarrow a = \frac{2}{2}$$

$$= 1$$

$$\therefore a = 1, d = 5$$

$$S_{20} = \frac{20 \times 10}{2} [2 \times 1 + 19 \times 5]$$

$$= 10 \times 97$$

$$= 970$$

② i Integers between 1 and 500 are

2, 3, 4, 5, ..., 498, 499

Multiples of 2 as well as 5 are

10, 20, 30, ..., 490

$$a = 10, d = 20 - 10 = 10$$

$$a_n = 490$$

$$a + (n-1)d = 490$$

$$10 + (n-1)10 = 490$$

( $\div 10$ )

$$1 + n - 1 = 49$$

$$\Rightarrow n = 49$$

$$S_{49} = \frac{49}{2} (10 + 490)$$

$$= \frac{49}{2} \times 500$$

$$= 49 \times 250$$

$$= 12250$$