

10 2, 7, 12, ... to 10 terms

$$a = 2, d = 7 - 2 = 5$$

$$\begin{aligned} S_{10} &= \frac{5 \cdot 10}{2} [2 \times 2 + 9 \times 5] \\ &= 5(4 + 45) \\ &= 5 \times 49 \\ &= 245 \end{aligned}$$

11 -37, -33, -29, ... 12 terms

$$a = -37, d = -33 - (-37) = 4$$

$$\begin{aligned} S_{12} &= \frac{6 \cdot 12}{2} [2(-37) + 11 \times 4] \\ &= 6[-74 + 44] \\ &= 6(-30) \\ &= -180 \end{aligned}$$

111 0.6, 1.7, 2.8, ... 100 terms

$$a = 0.6, d = 1.7 - 0.6 = 1.1$$

$$\begin{aligned} S_{100} &= \frac{50 \cdot 100}{2} [2 \times 0.6 + 99 \times 1.1] \\ &= 50(1.2 + 108.9) \\ &= 50 \times 110.1 \\ &= 5505 \end{aligned}$$

112 $\frac{1}{15}, \frac{1}{12}, \frac{1}{10}, \dots$ 11 terms

$$\begin{aligned} a &= \frac{1}{15}, d = \frac{1}{12} - \frac{1}{15} \\ &= \frac{5-4}{60} \\ &= \frac{1}{60} \end{aligned}$$

$$\begin{aligned} S_{11} &= \frac{11}{2} \left[2 \times \frac{1}{15} + 10 \times \frac{1}{60} \right] \\ &= \frac{11 \times 2}{2} \left[\frac{1}{15} + \frac{5}{60} \right] \\ &= 11 \left[\frac{4+5}{60} \right] \\ &= \frac{11 \times 9}{60} \\ &= \frac{33}{20} \end{aligned}$$

20 $7 + 10\frac{1}{2} + 14 + \dots + 84$

$$a = 7, d = 10\frac{1}{2} - 7 = \frac{7}{2}$$

$$\begin{aligned} a_n &= 84 \\ a + (n-1)d &= 84 \\ 7 + (n-1)\frac{7}{2} &= 84 \end{aligned}$$

$$\begin{aligned} \left(\times \frac{2}{7} \right) a + n - 1 &= 24 \\ \Rightarrow n &= 23 \end{aligned}$$

$$\begin{aligned} S_{23} &= \frac{23}{2} (7 + 84) \\ &= \frac{23}{2} \times 91 \\ &= \frac{2093}{2} \\ &= 1046\frac{1}{2} \end{aligned}$$

$$S_n = \frac{n}{2} (a + l)$$

$$S_n = \frac{n}{2} [2a + (n-1)d]$$

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