

4.  $a=9$   $d=17-9=8$   $S_n=636$

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

$$636 = \frac{n}{2} (18 + 8n - 8)$$

$$4n^2 - 5n - 636 = 0$$

$$(n-5)(n+2) = 0$$

$$n=5 \quad n=-2$$

5.  $a=5$   $S_n=400$   $d=45$

$$\frac{n}{2} (5 + 45) = 400$$

$$\frac{50n}{2} = 25n = 400$$

$$n = \frac{400}{25} = 16$$

$$400 = \frac{16}{2} [2 \times 5 + (16-1)d]$$

$$400 = 5 + 15d$$

$$15d = 400 - 5$$

$$d = \frac{395}{15} = \frac{79}{3}$$

$$n=16 \quad d = \frac{79}{3}$$

6.  $a=17$ ;  $a_n=350$ ;  $d=9$

$$a_n = 17 + (n-1)9$$

$$350 = \frac{38}{2} [17 + 350] = 19 \times 367 = 6973$$

7.  $d=7$ ;  $t_{22}=149$ ;  $n=22$

$$t_{22} = a + 49$$

$$\frac{149}{49} = a \quad a=2$$

8.  $a=5$ ;  $a_2=14$ ;  $a_3=18$

$$a+d=14 \quad a+2d=18$$

$$\begin{aligned} a+d &= 14 \\ a+2d &= 18 \\ \hline d &= 4 \quad a=10 \end{aligned}$$

$$S_n = \frac{51}{2} (2 \times 10 + 50 \times 4)$$

$$S_n = \frac{51}{2} (20 + 200)$$

$$\frac{51}{2} \times 220 = 5610 = S_n$$

9.  $S_7 = 49$

$$\frac{7}{2} (2a + 6d) = 49$$

$$a + 3d = 7$$

$$S_{17} = 289$$

$$\frac{17}{2} (2a + 6d) = 289$$

$$a + 3d = 17$$

10.  $a_n = 3 + 4n$

$$n = 1, 2, 3$$

$$a_1 = 3 + 4 \times 1 = 7$$

$$a_2 = 11$$

$$d = 4$$

11.  $S_n = 4n - n^2$

$$S_1 = 4 - 1 = 3$$

$$S_2 = 4 \times 2 - (2)^2 = 4$$

$$t_2 = 4 - 3 = 1$$

$$d = t_2 - t_1$$

$$a_2 = 6, d = 12 - 6 = 6$$

$$a_{40} = 240$$

13.  $S_{15} = 15 [2 \times 8 + (15-1)8]$

$$= \frac{15}{2} [16 + 112] = \frac{15}{2} \times 128$$