(6) AP: 11, 8, 5, 2 ...

$\Rightarrow d = 8 - 11$

$\boxed{d = -3}$

$\boxed{a_n = -150}$

$a = 11$

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

$-150 = 11 + (n-1)(-3)$

$-150 = 11 - 3n + 3$

$-3n = -150 - 11 - 3$

$-3n = -164$

$n = \frac{-164}{-3}$

$\therefore$ No

(7) $a_{11} = 38$

$a_{16} = 73$

$a + 10d = 38 \quad -(1)$

$a + 15d = 73 \quad -(2)$

$-5d = -35$

$d = \frac{-35}{-5}$

$\boxed{d = 7}$

$a + 10d = 38$

$a + 10 \times 7 = 38$

$a + 70 = 38$

$a = 38 - 70$

$\boxed{a = -32}$

$a_{31} = a + 30d$

$= (-32) + 30 \times 7$

$= -32 + 210$

$\boxed{a_{31} = 178}$

(8) $a_3 = 12$, $a_{50} = 106$

$a+2d = 12$ - (i)

$a+49d = 106$ - (ii)

$a+2d - a - 49d = 12 - 106$

$-47d = -94$

$d = \frac{-94}{-47}$

$\boxed{d = 2}$

$a + 4 = 12$

$a = 12 - 4$

$\boxed{a = 8}$

$a + (n-1)d$

$\Rightarrow 8 + (29-1)2$

$\Rightarrow 8 + 28 \times 2$

$\Rightarrow 8 + 56$

$\Rightarrow 64$

$\boxed{a_{29} = 64}$

(a) $a_3 = 4$, $a_9 = -8$

$a+2d = 4$ - (i)

$a+8d = -8$

$-6d = 12$

$d = \frac{-12}{6}$

$\boxed{d = -2}$

$a + 2x - 2 = 4$

$a - 4 = 4$

$a = 4 + 4$

$\boxed{a = 8}$

$a+3d$

$= 8 + 3 \times -2$

$= 8 - 6$

$= 2$

$a+4d$

$= 8 + 4 \times -2$

$= 8 - 8$

$= 0$

$\boxed{a_5 = 0}$ ; 5th term

(10) $a_{17} - a_{10} = 7$.

$= a + 16d - (a + 9d) = 7$

$= a + 16d - a - 9d = 7$

$= 7d = 7$

$= d = \frac{7}{7}$

$\Rightarrow \boxed{d = 1}$

(11) AP: 3, 15, 27, 39, ...

$a = 3$

$d = 15 - 3$

$\boxed{d = 12}$

$n = 54$.

$\Rightarrow a_{54} = a + (n-1)d$

$= 3 + (54 - 1) \times 12$.

$= 3 + 53 \times 12$.

$= 3 + 636$

$= 639$.

$\boxed{a_{54} = 639}$

$639 + 132 = 771$

$a_n = 771$

$771 = 3 + (n-1) \times 12$

$771 - 3 = (n-1) \times 12$.

$768 = (n-1) \times 12$.

$\frac{768}{12} = n - 1$

$64 = n - 1$

$n = 64 + 1$

$\boxed{n = 65}$

2) For 1st AP

1st term = A.

common difference = d

100th term = A+99d

For 2nd AP

1st term = a.

c.d. d

100th term = a+99d

difference = $A+99d-a-99d = 100$

$A-a = 100$ — (1)

difference between 1000th terms,

$= A_{1000} - a_{1000}$

$= [A+(1000-1)d] - [a+(100-1)d]$

$= [A+999d] - [a+999d]$

$= A+999d-a-999d$

$= A-a$

= Putting values from (1)

$= A-a = 100$