Q7. Which term of AP 15, 30, 45, 60 .... is 300? Hence, find the sum of all the terms of the AP.

$a = 15$

$d = 30 - 15 = 15$

$a_n = 300$

$a + (n-1)d = 300$

$15 + (n-1)15 = 300$

$15(n-1) = 285$

$n - 1 = 19$

$n = 20$

$a_{20} = 300$

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

$S_{20} = \frac{20}{2}(15 + 300)$

$= 10 \times 315 = 3150$

Sum of AP = 3150

Q8 The nth term of an AP is given by the relation $a_n = 6(7-n)$. Find

i) its first term and common difference
ii) sum of its first 25 terms.

$a_n = 6(7-n)$

$a_1 = 6(7-1)$
$= 36$

$a_2 = 6(7-2)$
$= 6 \times 5$
$= 30$

$d = a_2 - a_1$
$= -36 + 30$

$\boxed{d = -6}$

$\boxed{a = 36}$

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

$= \frac{25}{2}[2(36) + (25-1)(-6))$

$= \frac{25}{2}[72 + 144]$

$= \frac{25}{2} \times 216 = 2700$

$$= \frac{25}{\cancel{2}} \times (-\cancel{72}^{36})$$

$$= 25 \times (-36)$$

$$= -900$$

Sum of 25 terms of AP = -900

Q9 i) Write the nth term of an AP consisting of all whole numbers which are divisible by 3 and 7.

ii) How many of these are two digit numbers? Write them

iii) Find the sum of first 10 term of this AP

whole numbers which are divisible by 3 and 7 are 21, 42, 63 ....

$a = 21$

$d = 42 - 21$

$= 21$

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

$a_n = 21 + (n-1)21$

$a_n = 21 + 21n - 21$

$= 21n$

i) $\boxed{a_n = 21n}$

AP => 21, 42, 63, 84, 105

$a_n < 100$

$21 + (n-1)21 < 100$

$21n < 100$

$n \leq \frac{100}{21}$

$n < 4.76$

ii) ∴ 4 2 digit numbers are: 21, 42, 63, 84

$S_n = \frac{n}{2}[a + a_n]$

$S_n = \frac{10}{2}[a + a_{10}]$

$= 5[21 + 21 + (10-1)d]$

$= 5[49 + 9 \times 21]$

$= 5[42 + 189]$

$= 5 \times 231$

$= 1155$

iii) Sum of first 10 terms of AP : 1155

Q10. The 5th term and 9th term of an AP are 4 and -12 respectively. Find.

i) the first term
ii) common difference
iii) sum of 16 terms of the AP

$a_5 = 4$
$a_9 = -12$

$a_5 = a + 4d = 4$ --- a)
$a_9 = a + 8d = -12$ --- b)

on subtracting Eq(a) from Eq(b) we get:

$4d = -16$
$d = -4$

$a + 4(-4) = 4$
$a = 4 + 16 = 20$

i) First term = 20
ii) Common difference = -4
iii) Sum of 16 terms of AP