ANSWERS

A) -10

B) ± 9

C) $\left(-\frac{15}{2}, \frac{4}{3}, -\frac{27}{2}\right)$

A) In an arithmetic sequence of ten terms, the tenth term is 14, and their sum is 5. Find the second term.

$a_1 + 9d = 14$, $5(2a_1 + 9d) = 5$ so $a_1 + 9d = 14$

$2a_1 + 9d = 1$ $a_1 = -13$

$-13 + 9d = 14$, $9d = 27$, $d = 3$.

$a_2 = a_1 + d = -13 + 3 = -10$

B) The second term of a geometric sequence is 12, and the sixth term is 1024/27. Find the first term.

$12 r^4 = \frac{1024}{27}$, $r^4 = \frac{1024}{12 \cdot 27} = \frac{256}{81}$, $r = \pm \frac{4}{3}$

$a_1 = \frac{a_2}{r} = \frac{12}{\pm \frac{4}{3}} = \pm \frac{12}{1} \cdot \frac{3}{4} = \pm 9$

C) The six terms $2x - 3$, t, $7 - 12y$, $x + 3$, $3y - 4$, $x + 12$ are in arithmetic sequence. Find the ordered triple (x, y, t).

$(x + 12) - (x + 3) = 9 = 2d$, $d = \frac{9}{2}$. $(3y - 4) - (7 - 12y) = 9$.

$15y - 11 = 9$, $15y = 20$, $y = \frac{20}{15} = \frac{4}{3}$, $a_3 = 7 - 12y = 7 - \frac{12}{1} \cdot \frac{4}{3} =$

$7 - 16 = -9$, so $a_2 = a_3 - d = -9 - \frac{9}{2} = -\frac{27}{2}$, $a_4 = x + 3 = a_3 + d =$

$-9 + \frac{9}{2} = -\frac{9}{2}$ so $x + 3 = -\frac{9}{2}$ and $x = -3 - \frac{9}{2} = -\frac{6-9}{2} = -\frac{15}{2}$,

ANS $(x, y, t) = \left(-\frac{15}{2}, \frac{4}{3}, -\frac{27}{2}\right)$