AK2MT 101 E

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Answers

1. (a) $5^2 - 1 = 24$
   (b) $10^2 - 1 = 99$
   (c) 99

2. (a) d = 77 – 70 = 7
   (b) 20th term - 10th term = $X_{20} - X_{10}$ = (20 – 10) x d
   $= 10d = 10 \times 7 = 70$

   (c) 70,140   or
      77,154   or
      84,168   etc

3. $X_8 = 36$, $X_{10} = 28$
   (a) $d = \dfrac{X_{10} - X_8}{10-8} = \dfrac{28 - 36}{2} = \dfrac{-8}{2} = -4$

   (b) $X_8 = X_1 + 7d = 36$
       $x_1 + 7(-4) = 36$
       $x_1 - 28 = 36$
       $x_1 = 36 + 28 = 64$

   (c) $X_n = dn + (f - d)$
       $= -4n + (64 - (-4))$
       $= -4n + (64 + 4)$
       $= -4n + 68$

   (d) $X_{11} = X_{10} + d$
       $= 28 + (-4)$
       $= 28 - 4 = 24$

4. 4,9,14,19,........
   (a) d = 9 – 4 = 5
   (b) 24,29
   (c) $X_n = dn + (f-d)$
       $= 5n + (4-5)$
       $= 5n - 1$

5. $X_n = 8n+3$
  (a) $d = 8$
  (b) $11, 19, 27....$
  (c) 3
  (d) $n = \dfrac{X_n - X_1}{d} + 1$

$$= \dfrac{395 - 203}{8} + 1$$
$$= \dfrac{192}{8} + 1$$
$$= 24 + 1 = 25$$

6. (a) $3 \times$ middle term $= 36$
   middle term $= \dfrac{36}{3} = 12$

  (b) $X_2 = 12$
    $d = 2$
    $X_1 = 12 - 2 = 10$
   sequence is $10, 12, 14......$

7. (a) $X_5 = \dfrac{45}{9} = 5$
  (b) Sum of 10th to 18th terms $= 171 - 45 = 126$
  (c) $X_{14} = \dfrac{126}{9} = 14$

8. (a) $f = 6$
    $d = 12 - 6 = 6$
    20th term $= f + 19d$
            $= 6 + 19 \times 6$
            $= 6 + 114 = 120$
  (b) Sum $= \dfrac{n}{2} \times (X_1 + X_2)$
        $= \dfrac{20}{2} \times (6 + 120)$
        $= 10 \times 126 = 1260$

  (c) Sum $= 1260 + 20 = 1280$

9. (a) $f = 3 \times 1^2 + 1 = 3 + 1 = 4$
    Sum of first 2 terms $= 3 \times 2^2 + 2 = 12 + 2 = 14$
    $X_2 = 14 - 4 = 10$
  (b) $d = 10 - 4 = 6$
  (c) sequence is $4, 10, 16....$

(d) $X_n = dn + (f-d)$
  $= 6n+(4-6)$
  $= 6n-2$

10. (a) $1+2+3+............+30$
    $=\dfrac{n(n+1)}{2} = \dfrac{30 \times 31}{2}$
    $= 465$

(b) $3+6+9+............+30 = 3(1+2+3+.......+10)$
    $= 3 \times \dfrac{10 \times 11}{2}$
    $= 165$

(c) $5+8+11+...........+32 = (3+2) + (6+2) + (9+2) + ...+ (30+2)$

    $= 3+6+9+...........+ 30 + (2+2............+2)$
    $= 165+2 \times 10$
    $= 165 + 20 = 185$

(d) $2+5+8+...........+29 = 3-1 + 6-1 + 9-1+...............30-1$
    $= 3 + 6 + 9 + ...+ 30 - (1+1+1+...............+1)$
    $= 165-(1 \times 10) = 165-10 = 155$

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